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The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

With this issue we enter into the year 1914 with good prospects and rising prices for all our products, a continuation of which is devoutly to be hoped for. Looking back over the past year we note with pleasure the greater unanimity amongst planters to bring to a definite and satisfactory conclusion some thorny subjects that have for years been the subject of discussion. We consider that from a business point of view the last Annual Meeting was the most practical held since the inception of this Association. Though not yet settled, the Labour Question still looms large and fills the eye and mind most, and all must look forward with anticipation, not unmixed with anxiety, to the Extraordinary General Meeting.

The Malay Planters, it will be noticed, have decided not to reduce wages, and this should be borne in mind when Delegates meet. The Malay Planters, consulting their own interests, recognise that such reduction would have a fatal effect on their Labour supply from South India. You cannot deny to them the right to exact such tasks from their labour to compensate for their high wages. This carried too far only spells slavery in another way, and the cooly is not so weak or so ignorant in these days to submit to imposition. It is for the Indian Planter to combat and oppose emigration by all legitimate means: and these means we are convinced are to be attained only by combination amongst themselves. Stop emigration in one place, it raises its hydra head elsewhere, nor should emigration be prevented, for no one has a right to prevent another bettering himself if possible. But there is a moral obligation attaching to emigration which should be carefully watched, especially in the case of such illiterate labour as leaves Indian shores. We would call attention to the speech by the Premier of Australia, in which he foreshadows that Orientals are required to open up and cultivate the fertile millions of acres in that country and if encouraged by Government the Indian will not be slow to grasp the opportunity offered. The Labour members of Parliament demand the repatriation of Indians from Natal and South Africa. Will they not look to that country as an outlet?

Scientific Officer's Papers.

CXXV.—Grape Vine Mildew.

A number of South Indian planters are interested in the cultivation of Grapes, either commercially or on a small scale for supplying their own table, and as Grapes are nearly always attacked by Mildew and constant enquiries are being received as to how to cure this disease, it is hoped that the following information, compiled from the sources mentioned, may be of use and interest.

Grape Vines are attacked by Mildew in all countries. When the fruit is quite small a white flour-like powder appears on their surface and the grapes then never develop properly and finally crack, and become black and worthless. At the same time patches of the powder will be found on the leaves and shoots where it causes brown dead patches. This powdery appearance and the damage it causes is due to a fungus known as *Plasmopara viticola*, and its life history is thus described in the *Gardeners' Chronicle* (LIV. 1406) in the course of a review of a study of the subject of Grape Vine mildew published by Drs. Gv. de Istvanffi and Gv. Palinkas in the *Annales de l' Institute Central Ampelogigue Royal Hongrois (IV. 1913)*.

"The mycelium attacks all the soft tissues of the plant; leaves, buds, tendrils, flowers and fruit. It runs in the spaces between the cells and sends innumerable suckers into the cells. The fungus produces a=sexual spores (conidia) and sexual spores (oogonia). The former give rise to summer infection, and by their numbers cause the disease to spread with terrible rapidity from plant to plant. The oogonia are resting spores which hibernate in the fallen foliage and other debris of the vine and give rise to infection in the beginning of each year.

"The conidia as a rule give rise each to a number of naked motile spores (zoospores), which infect the plant. They may, however, germinate directly; that is to stay, each produces a germ tube which penetrates into the plant.

"Infection takes place through the stomata, and hence it occurs mainly on the lower surface, over which the stomata are widely distributed. Inasmuch, however, as stomata occur also on the upper surface at the edges of the leaf and close to the veins, infection may be effected by way of the upper surface also.

"The summer conidia are produced in cushions or efflorescences of hyphae, which form just beneath a stoma, and it is of the greatest importance to know that at least a day elapses between the time at which these white efflorescences may be recognised by the naked eye and the time at which the conidia are liberated. Since mere traces of copper sulphate (1 in $1\frac{1}{2}$ million parts of water) suffice to prevent the germination of the conidia, and since the conidia do not germinate until 24 hours after they have been shed, the vigilant grower has a means of preventing the further progress of the disease. Sulphur and, when possible, Bordeaux Mixture, are the fungicides commonly employed. Another point of great importance lies in the fact that, except in certain circumstances, the disease may be diagnosed at a yet earlier stage than that which marks the appearance of the white efflorescences. The means of diagnosis are afforded by transparent spots or patches. The patches are first pale green and later ochre yellow. They make their appearance first on the teeth of the leaf and along

the veins. They have zigzag edges, and are sharply marked off from the rest of the leaf. These oil spots make their appearance whenever infection has taken place in a growing green part, in a young leaf, for example. They are due to the fact that the mycelium destroys the chloroplast, and the oily basis of the destroyed chlorophyll grains is distributed throughout a certain area owing to the stretching of the growing leaf."

Mr. Burns, the Economic Botanist to the Government of Bombay, has been doing some work on the use of Bordeaux Mixture to control this disease during the past three years and his efforts have met with a considerable amount of success. The work is described in *Bulletins No. 36 of 1910, No. 45 of 1911, and No. 51 of 1912 of the Bombay Department of Agriculture*,

The recommendations made as a result of the three year's work are, first to thoroughly clean the vines by rubbing off all loose bark and by cutting out all dead and cracked spurs; secondly to keep the vine yard free from weeds and avoid giving excess of water especially in cloudy weather; thirdly to spray with Bordeaux Mixture.

Two strengths of Bordeaux are used for spraying, the normal solution made with 3 lbs. of Copper Sulphate, and 2 lbs of Lime to 25 gallons of water, and half normal solution made with 3 lbs of Copper Sulphate and 2 lbs of Lime to 50 gallons of water. To both these solutions 2½ lbs of soft soap are added to to make the solution stick better. 25 gallons is sufficient for 85 vines.

The vines should be sprayed five times, the first application being made in the middle of May, the second in the middle of August, the third in the middle of October, the fourth at the beginning of December, and the fifth at the beginning of January, the last two being with half normal solution, and more directly applied to the bunches of fruit. Spraying should be done in the evening in the hour before sunset. The liquid thus remains on the leaves for a longer time without getting dried up and there is no danger of the drops of liquid acting as lenses to the sunlight and burning the leaves.

It is pointed out that it is necessary to wet both sides of the leaves and hence the vines must be sprayed from below as well as from above. It is necessary also to see that recesses of the foliage are reached by the spray.

The bunches of fruit must be sprayed with half normal Bordeaux Mixture and soap whenever all the flowers have disappeared and the berries formed, and close watch must afterwards be kept over the bunches. The appearance of a trace of mildew upon one berry in a bunch must be the signal to respray that bunch. Next in importance to this period it is important to spray in the breaks of the early rains.

The sprayer used during this work was a bucket sprayer made by Messrs. McDougall Bros. Co., Oriental Buildings, Bombay and cost Rs.15,

With regard to the cost of spraying it is estimated that it costs one anna per vine per annum, so that this remedy which has proved eminently successful is a very economical one.

RUDOLPH D. ANSTEAD,
Planting Expert.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Oxalis on Tea Estates.—Oxalis violacea has become a well established and troublesome weed in some parts of the Nilgiri Hills, and it has now put in its appearance on one estate at least in Peermade, where it is looked upon with a certain amount of alarm. The plant appears to be common in some parts of Ceylon and it was proposed at one time to include it as a noxious weed under the Plant Pests Ordinance, though I do not know whether this was done. Mr. Kelway Bamber writing on the subject said that spraying with Sodium Arsenite, Muriatic Acid, salt solution, etc. had been tried without success. Heavy mulching with Grevillia leaves, &c., is partially successful and similar thick mulching of infected areas with tea prunings and everything available was recommended. The weed is said by some to cause a heavy loss of crop in tea, but others again state that there is little loss and that only temporary. While it no doubt absorbs much of the manure applied to the tea this is given back again with added humus when the leaves decay, while loss of surface soil is prevented in dry districts and on steep slopes. The plant dies back in the dry weather, but the bulbs are not killed. It requires a fair amount of air and light to thrive so that green dressings, and the tea bushes themselves as they close in, kill it. It is in young clearings and in pruned tea where it is likely to get away and do damage. If labour is available and the infected area is only small the surest way of eradicating a weed like this is to get over it constantly and pull off all the leaves as soon as they make their appearance. Without leaves the plant is unable to manufacture food for storage in its underground bulbs, and this must in time kill it. It seeds freely and should not be allowed to flower.

Species of Oxalis are very liable to spread rapidly and form dense masses, taking almost complete possession of the soil in localities suited to them. It is of interest to note that C. L. Degoy when describing a Botanical trip in Corsica in the *Gardeners' Chronicle* (LII—1355) reported *Oxalis Lybrica* (*cernua*) as being "very luxuriant and becoming extremely troublesome when any sort of cultivation is attempted. Fifty years ago Ajaccio was the only place in Europe where it was to be found, but since then it has become disseminated all over the French and Italian Riviera. During the winter its clover shaped. brilliant green leaves make a vivid ground work over which the long stemmed umbels of bright yellow flowers hang in profusion. The flowers shut at night, but open widely with the first rays of the rising sun. This species is said to be seedless; it is propagated by means of a rhizome which grows underground and produces numbers of small bulbs."

Cleaning the Stems of Tea Bushes.—When tea is pruned it is usual to clean the stems and free them from the epiphytic growths of ferns, orchids, moss, and lichens which are apt to accumulate upon them, especially in districts of high rainfall. Exactly how much harm these growths do under normal conditions it is difficult to say, and it must be borne in mind that such forms of vegetation are not parasites; they take nothing out of the tea bush itself but only use the stem as a suitable support. That is to say they are quite a distinct class of plants to the 'Mistletoes' to be seen on the jungle trees. These latter are true parasites and actually put down a kind of root, known as 'haustoria', into the stem of the host plant and rob it of its elaborated sap to the detriment of the tree. Such true parasites are capable of doing a great deal of harm, and throughout the Malnad the shade trees in coffee, and certain kinds of jungle trees are being killed by the 'Mistletoes'. Dodder which attacks Flax is another familiar example of a

parasite. The lichens and mosses which grow on the stems of tea bushes are, however, merely epiphytic, they grow on the stems but do not enter the tissues of the tea bush, or extract its sap. That they do a certain amount of indirect harm, however, is certain. They clog up the breathing pores of the bark tending to retard its growth and make it unhealthy and the tree is apt to reach a state which is known to the planter as 'hide-bound'. The bark becomes hard and restricts the free circulation of the sap. The cover given by these growths also acts as a shelter for scale insects and a resting place for spores of fungi. Consequently it is usually advisable to periodically clean the stems, and the most suitable time to do this is when the tea is pruned, since then the bare stems can easily be got at. Thus Watt and Mann in their standard book upon the '*Pests and Blights of the Tea Plant*' say, "old bushes and those growing in localities with too much shade, and imperfect ventilation, or defective drainage, or a moist temperate climate become coated with lichens and mosses. Their presence is one of the most striking indications of a 'hide-bound' bush, but they are in reality the consequence and not the cause of the condition complained of. In the majority of cases it will be found that age is the chief cause of the hide-bound condition, as also of the coating of lichens, mosses, and other similar growths. So long as a plant is vigorous, and its stem constantly expanding in circumference, lichens will make little headway. Let its activity decline from age, unfavourable surroundings, or disease, and it will immediately harbour lichens and mosses."

At every pruning season, therefore, an attempt should be made to get rid of these epiphytic growths and clean up the stems. The usual custom is to dust the stems with Lime, or scrub them with lime water. This method, however, is not altogether satisfactory. If thoroughly done it kills the epiphytic growths for the time being, but it has little permanent effect and it would be well worth experimenting with other mixtures, more expensive to employ no doubt, but of a more lasting effect and therefore cheaper, since they tend to promote the health of the tea bush and keep it free from growths for a longer time. A mixture recommended for the purpose by Mr. Lefroy when he held the post of Imperial Entomologist is the following :—

1 pint Crude Carbolic, or phenyle.
2 lbs. Soft Soap.
1 gallon hot water.

Dissolve the soap in hot water and stir in the carbolic. Add 10 gallons of water and enough clay to thicken it and apply with either a brush or a sprayer.

The following formulae are recommended by the Scientific Department of the Indian Tea Association :—

1. 2 lbs. 98% Caustic Soda, 10 gallons water. This gives a clear solution and can be used as a spray. 98% Caustic Soda in 5 lbs. tins costs 4½ annas per lb. in England.
2. 7 lbs. Washing Soda crystals, 2 lbs. quick lime, 10 gallons water.
3. 2½ lbs. Carbonate of Soda in powder, 2 lbs. quick lime 10 gallons of water.

These two latter formulae do not give clear solutions on account of the Lime in them. It should be noted that these mixtures must not be applied to *green* wood or leaves, so that they can only be used when the tea is clean pruned.

It would be of great value if some planters would undertake to experiment with these different washes, if only over a small acreage, and compare the results obtained with them as set against the cost of materials and application. This experiment could most easily be carried out in a district like Peermade where the Tea is only allowed to run a short time between prunings. In this district the effect of the washes could easily be judged by noting the freedom of the tea treated in different ways from epiphytes at the pruning next following the time of treatment, and comparing this with the accumulation of growths when the tea is cleaned in the ordinary way with Lime, or the epiphytes merely picked and rubbed off. I hope that someone will undertake this comparatively simple experiment and publish the results for the benefit of the planting community.

Quality of Plantation Rubber.—The chief reason that plantation rubber is inferior to fine hard para as produced from the wild trees from the manufacturer's point of view appears to lie in the fact that the same factory seldom turns out two lots alike; indeed worse still the different sheets in one chest are not always all of the same quality. Consequently when the manufacturer buys something which suits his particular purposes from one estate he can never be sure of procuring the same quality of material from the same estate again. That there is a great deal of truth in this complaint I am convinced from conversations with buyers on the one hand and personal inspection of the rubber turned out by the estate factories on the other. The Standardisation Committee of the Rubber Growers Association are aiming at removing this defect of plantation rubber by introducing some system of testing to indicate quality for the benefit of both buyers and sellers. It is proposed that some central practical testing station should grant certificates of quality and that an experimental factory should be started to advise manufacturers as to the best types of rubber to use for different purposes, and as to mixings, new uses for rubber, etc. The test used for quality will probably be the vulcanising capacity of the rubber, that is its rate of cure, and an index figure will be adopted which will indicate the tensile and physical qualities of the rubber after vulcanisation. This plan would enable the manufacturer who required some particular quality of rubber to be sure of getting the same thing again and again by buying on an index number, and a test certificate. Such a system would undoubtedly inspire confidence and would help the sellers quite as much as the buyers, since they could turn out rubber in the factories to some index number and would always know exactly what the real quality of the rubber they were selling was. The official report of the Standardisation Committee should be published very shortly and it is to be hoped that the South Indian rubber planters will be among the very first to avail themselves of the advantages which standardisation will undoubtedly possess, and endeavour to create a special demand for South Indian rubber by making it always conform to a particular mark of a high quality.

Synthetic Nitrogen-containing Fertilisers.—The International Institute of Agriculture, Rome, has recently published a book of statistics showing the amount of production and use of artificial fertilisers throughout the world. It appears from this that fertilisers like Nitrolim and Nitrate of Lime, the Nitrogen in which is obtained by electrical means from the atmosphere, are being very widely used. The production of Nitrolim at the present time is about 87,000 tons and the production during 1913-14 is estimated to reach 200,000 tons. The estimated output of Nitrate of Lime during 1913 is 140,000 tons.

R. D. A.

THE PREVENTION OF MALARIA; ITS RELATIONSHIP TO AGRICULTURE.

By Malcolm Watson, M.D., D. Ph., Klang, F.M.S.

(*Continued*).

Panama.—The making of the canal is not an agricultural operation; it is rather the reverse, for the canal zone is being depopulated of all except the canal workers, and most of these too will go when the canal is completed. But as the greatest sanitary achievement the world has seen it has a lesson for us. I went there because I wanted to study the details of their methods, in particular how much of their excellent results was due to drainage, and how much to screening, oiling, and quinine. From my visit I concluded the results were mainly from oiling, which was done for practically half a mile on each side of the canal, or at least the inhabited portions of the zone. The great majority of the population do not live in screened houses, and very few take quinine. Drainage is constantly interfered with, and there is no agriculture. Col. Gorgas had, therefore, everything against him except the determination to win and money to back him, Depending on oiling, the organisation has to be, and is, perfect, for failure for a single week would allow mosquitoes to develop. Their position is as if they had a wild beast by the throat, but were not allowed to kill it; yet if for a moment their grip were to be relaxed, the beast would be on them. No greater sanitary work has been done: I doubt if we will see as great again. It is perfect work, and its organisation is the only kind that would have succeeded under the circumstances. Some of the methods I saw are already being put into action in the F. M. S. on my advice. I made a very careful study of the insect which was responsible for most of the malaria, and received every kindness from the Sanitary Officers—especially from Col. Phillips, who was acting for Col. Gorgas, Major Noble, and Dr. Darling, who kindly allowed me the use of his laboratory.

But I was unable to ascertain how the mosquitoes *A. Albimanus* and *A. Argyritarsis* would behave under cultivation. *A. Albimanus* breeds in a very considerable variety of places, and has as wide a range as probably any mosquito which exists. It is therefore on that account one of the most dangerous. But it has one limitation. It is essentially a pool breeder, and is never found in running water.

British Guiana.—It was, therefore, with considerable interest that I looked forward to a visit to British Guiana. The portion of that country most extensively inhabited is a stretch of low alluvial land along the coast. Most of it is below high tide level, having been reclaimed from the sea by the Dutch, and is protected by a dyke, or bund, or levee. The drains discharge at low tide through tide gates. In some places the water has to be pumped out. In such a place as this, and with such a mosquito as *A. Albimanus* there would be the supreme test to the theory that agriculture could abolish malaria, carried by a pool-breeding mosquito. Through the kindness of His Excellency Sir Walter Egerton and Dr. Rowland, acting Hon. Surgeon-General. Dr. Wise. and the Rev. Mr. Aitken, I saw a considerable part of the country and had access to all the statistics.

To sum it all up I found one estate with a population of 4,800 a spleen rate of 2, a malaria admission rate of 11, a total admission rate of 233, and a death rate of 5·6 per 1,000 for 1911. And the inhabitants of this estate actually lived on the edge of 3.000 acres of rice. This was not the only instance of extraordinary freedom from malaria enjoyed by the inhabitants of the low coastal lands of British Guiana, but it is enough to show that the

malaria problem there is already half solved, and the road to complete extinction clearly pointed out. That a mosquito like *A Albimanus* should be so easily eradicated is, in my opinion, of the highest significance, and gives us the highest hopes for many other countries.

I would just say a word about *Barbados* which, as you know, is said to be free from malaria owing to the presence of a minnow called "millions." I paid attention to the presence of fish in relation to malaria in the different countries I visited. As regards *Barbados*, the absence of malaria is not due to the "millions." It is due to the absence of breeding places. I drove some fifteen miles along its coast, and could only find two pools. The country is porous, being composed of a coral limestone, and there are not even rivers. The rivers marked on the maps exist only at the time of a tropical rain storm, and dry immediately after. I show you a photograph of one of the largest in the island. You can see for yourselves it is dry. It is important the "millions" theory should be exploded. They have been imported to many countries with high hopes, which I am afraid will not be realised.

I have now shown you how the new knowledge has given us, absolute control over the malaria of low flat land, and a knowledge of and high hopes of control of that in hill land. We have also every hope of abolishing malaria from rice fields. But for Ross's discovery that would have been impossible, The very greatness of the discovery has, however, had one disadvantage. It made men look at malaria from such an entirely new point of view that they forgot the old view, or certainly failed to fuse the old and the new. When men began to think of malaria in terms of the mosquito, after the first transport of delight at the discovery, they began to shake their heads and say, "How can we ever abolish all these mosquitoes?" and "This is a hopeless work." But let me take you back to the pre=Rossian days. They were dark days as compared with these. Personally I would rather call the time the dawn, from which shot out brilliant rays in promise of day. There was no more cunningly hid secret in all nature then the malaria secret. Men searched the heavens, and the earth, and the waters that covered the earth, and if they did not find it the steps by which Laveran, Colgi, and Manson gradually helped to track it down are among the most brilliant in the annals of medicine. They had many difficulties. Malaria was known to be connected with swamps, and to be reduced by drainage and cultivation. Yet against that they found in some places that flooding a swamp actually improved health ; while in other places drainage and turning up the soil actually produced serious outbursts of the disease ; and yet again malaria was found not in swamps, but in hills and dry sandy deserts. The whole subject was full of difficulties, that seemed to upset every theory. And when Ross at length proved the guilt of the mosquito, it was such a long step forward that when men looked round, they did not recognise the old landmarks.

It is to these old landmarks no less than to the new light that we must look if we would succeed. These old observations about swamps and drainage did not apply to towns. They applied to rural malaria. Our forefathers knew malaria did disappear at times from wide rural areas, sometimes by the drying of the land, sometimes by flooding it.

It had been proved hundreds of times—and indeed was the most outstanding feature in our knowledge of malaria. To-day I have merely shown you instances from different parts of the globe of what was well known to our fathers. There is nothing really new except that now we are able to understand better how the change takes place. It is because we have in the mosquito the key to the process of improvement in health that I have

high hopes for the future. I believe that the prevention of malaria, the improvement in health of the agriculturist, and the cultivation of the land are all intimately connected, and that what improves the one will improve the other. But, and this is my last word, before money is spent on agriculture in the name of malaria prevention, the spending authority should insist on the medical officer showing sound practical reasons for the advice he has given. Such reasons should be based on a study, not only of the malaria-stricken parts of the country, but also of the healthy portions, for it is in the latter the secret is hidden which will bring health to the whole land.

After the Paper the Chairman (Sir Ronald Ross) said: Dr. Watson began the practical prevention of malaria in the Malay States some twelve years ago, and medical history had recorded the great victory which, with the help of Dr. Travers and others, he had obtained more especially in the two towns of Klang and Port Swettenham. Dr. Watson had carried the campaign into the surronding country, and one could not express too great appreciation of the value of his service to medical science and sanitary science in general.

Mr. Norman Grieve recalled that he had the opportunity of testifying to the excellent work Dr. Watson was doing on the occasion when, at a meeting of the Institute, Mr. Austen Chamberlain was appealing on behalf of the Tropical School of Medicine. On an estate of which he was a director, about the time of which he was speaking, they had, under Dr. Watson's supervision, been carrying out a most important agricultural scheme for the prevention of malaria. All the really great things in the world, how simple they seemed when explained by men like Sir Ronald Ross, but we must not imagine they were so simple to the men who discovered them. They had toiled in malarial places and risked their lives in the pursuit, and not only those engaged in agriculture, but everybody living in the tropics, owed them a deep debt of gratitude.

Mr. Cyril Baxendale, as a planter, expressed cordial appreciation of the splendid work done in the Malay Peninsula, not only for those engaged in the rubber, cocoanut, and other industries, but for the welfare of the community generally. He had known Dr. Watson from his first arrival as a young doctor. It was a red-letter day when they persuaded Dr. Watson to abandon the Government service and devote his attention to a field which gave greater scope for his abilities.

Mr. T. H. Hatton Richards bore witness from personal experience to the value of tropical research in providing remedies and preventives for tropical diseases.

The Chairman, proposing a vote of thanks to Dr. Watson, said he thought consideration must now be given to the question whether insects could not be reduced by attention to the chemical nature of the water, or by the introduction of biological enemies, or perhaps by the removal of the food of the insects. These and other points would, he hoped, be touched upon before a society of a medical character.

Replying, Dr. Malcolm Watson acknowledged the hearty support he had received from those among whom he had worked—from the planters in British Malaya and also from the Americans, whose great work in sanitation at Panama was only equalled by the kindness and modesty with which they had carried out that work. It was the Chairman's work they were following. But for that, nothing that had been done would have been possible.

A vote of thanks was given to Sir Ronald Ross for presiding.—*United Empire.*

CORRESPONDENCE.

Cowcoody,
Somwarpett,
N. Coorg,
24th December, 1913.

The Labour Commission.

THE EDITOR,
Planters Chronicle,
Bangalore.

Sir,—Mr. Danvers remarks about 9*d*. for 4*d*. are rather unfortunate. It reminds one that Mr. Lloyd George's panacea—*i.e.* the creation of a crowd of inquisitional officials, has in every case increased expenditure enormously, far beyond his own estimates, while the remedy has proved worse than the disease. Members of the trust may think themselves lucky if they escape in the end with only Rs.2 per acre. The question is where are these cesses going to stop? We have now Government taxes ... Rs.2

Scientific Fund, etc.	...	„ 1
Labour trust	...	„ 2
Total Rs...		5

besides sundries in the Planters' Benevolent Fund, local cess, etc. Taking the average profits on coffee at Rs. 50 an acre, this is equivalent to a 10 per cent. tax on profits. Even in England an income-tax of 5 per cent. is groaned under and a few years ago was considered war rates. Government taxes cannot be helped and no sensible man objects to the Association and Scientific Funds. They fulfil a worthy object and benefit chiefly the poor and ignorant. The proposed trust cess is in a different category and, if it does any good at all, will only benefit the large companies. Men who are only risking their own money and not that of a confiding public may be allowed to take a serious view of the additional expenditure. We have heard hitherto mainly the full blooded optimists. The effects of a trust are always uncertain, but there must be a respectable minority of opinion which considers that the trust will:—

1. Enormously increase the rates of pay.
2. Lead to a large increase of quarrels and friction.

fortunately at present rare in S. India. Ceylon and the Straits both have Commissions, yet one hears of wholesale crimping, ill-feeling, scarcity of labour, and numerous cases of kidnapping and worse by the native staff. This, in spite of the fact that rates are extremely high. The fact is that *free* labour depends primarily on 1. Superintendent, 2. The Climate, 3. Communications and supply and price of food. When a census, country, and routes of coolies, are given, presumably the previous bagmen of the trust will infest these routes. They will cry up the highest rates of pay, forgetting to state what makes these high rates necessary. The cooly being gullible will be led away and when he finds out his mistake and wishes to return he will find that under the trust he is no longer a free labourer. Their detective agency combined with means of always keeping him in debt will be too much for him. One seems to see writ large over the scheme, "It's your labour we want." The trust will establish a virtual slavery and the only reason that Government looks with favour on these Commissions is that it is less trouble to deal with

a Corporation than with a number of individuals. In my district 4 as, an acre would probably more than cover what is lost annually in advances, while the few cases of rogues who take advances from two or more estates are settled amicably between the parties. Coffee is in a favourable position owing to its being long established, generally under favourable living conditions, and largely in the hands of private individuals. The trust will come, but it cannot benefit coffee planters and may do them harm. Let them bow to the storm, not help it on.

Yours faithfully,
L. NEWCOME.

I do not know whether "Dyspeptic" will find this indigestible nor does it matter. Anonymity is a form of moral cowardice and not worthy of serious attention.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—I am uncertain when there is likely to be a meeting of Delegates to argue, and I hope settle, the lines of a Labour Commission.

I have agreed to join, *i.e.* put my estate in as subscribing to the original proposition, not because I see much in it, but in order to help any possible movement. A Recruiting Commission, or Company, would enlist my sympathy and heartfelt thanks—and I should of course join that—rather than a Commission that advises me *what not to do.*

It is extraordinary what a lot of individuals have told me this already, without helping me to affluence any other way.

I am, dear Sir,
Yours faithfully,
W. H. RAIKES.

Adderly Estate,
Coonoor, P. O.
1st January 1914.

Green Bug.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—The weather is at present favourable to this pest and I find it is hatching out in places.

In the Scientific Officer's letter of 18th July last on this subject he mentioned Soda Ash as an alternative for washing Soda.

I obtained a supply of this and have carried out experiments with it, using various quantities until I found the required strength. The results I

have obtained with Soda Ash have been so satisfactory that I would recommend others to try it. Its action combined with Soap and Rosin is much quicker then washing Soda.

The most efficient mixture I tried was prepared as follows :—

10 Oz. Soda Ash and 1 lb. Rosin (Powdered) are mixed and dissolved in one Kerosine tin boiling water, then 3 lbs. Soap is added and the whole stirred until soap is dissolved. To the above add 3 tins of water thus making 4 tins mixture at one boiling. The Rosin is soluble if mixed with Soda Ash.

This is the most effective mixture and the cheapest I have yet tried; Soda Ash in itself being cheaper than washing Soda. The coolies' hands suffer more with this mixture, but before commencing work I make them rub oil well into the skin.

Care should be taken in weighing out the Soda Ash as a little excess may destroy the foliage of the trees. It may interest others who have coffee at low elevations, where the small red ground ant is bad, to know that the following treatment was successful on some fields which were badly attacked by bug, and in which these ground ants were so numerous that all my brushing and spraying in previous seasons proved fruitless.

I applied the fields with shell lime covering the lime with mulch and followed this with trenching, then the fields were brushed throughout. I have since seen very few ants, and bug has only reappeared near some rocks and ravines; this after a period of 9 months. In all cases scraping stems should precede brushing and then the stems may be lathered with the mixture to the ground level. If carefully examined bug will frequently be found on the young suckers coming from the stem of the tree, hence the necessity to see that the stems also are thoroughly treated.

This applies to spraying as much as brushing.

Your faithfully,

L. A. GERRARD ROGERS.

REDUCTION OF COOLIES WAGES IN MALAYA.

A good deal of correspondence has taken place of late in the Malaya papers with regard to the reduction of coolies wages, and the general opinion seems to be that there should be some reduction from the present high rates paid. The effect of bringing down the high rates is made strikingly evident in the case of one estate. Here free Javanese tappers were paid fifty cents per day for a task of 300 trees. This has been reduced to 40 cents., and the task is to be increased to 400 trees. The reduction will affect 1,000 coolies, so that at ten cents per day this must mean a saving of £4,200 per annum. The saving through the increased task has also to be considered, and taking the rate at ten cents per 100 trees there will be a saving of ten cents per head per day—another £4,200 per year - making a total economy of £8,400 per annum, equivalent to a dividend of 6 per cent. on the capital of the Company concerned. In north Johore even higher rates are being paid, so the saving there will be even more. Many managers are of opinion that there will be no effect on immigration by the reduction, but it is hardly to be expected that coolies, though undoubtedly over paid in contrast with a few years ago, will consent to reduced wages and an increased task at the same time.—*Ceylon Observer.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer contributes an interesting article on the Nodules on Hevea Rubber Trees, culled from various authorities.

Capital does not attach much value to the prospects of the Weights and Measures Commission, but prophesies that the subject will be dropped. We trust that this Association will tender such evidence as to falsify this prophecy.

The Scientific Department publishes an inquiry from Mr. Hamilton which is of general interest, but it would be of much more general interest if those who have tried a weed killer would publish their experiments.

The Proceedings of the North Mysore Planters' Association are printed. Mr. Fowke read an interesting report as Delegate to the Dassara. We are glad to see that the Dewan has promised that if a Labour Act is introduced into Mysore it will be first of all submitted to the Planting Community, and we trust that their appeal for a European Assistant to the Director of Agriculture in Mysore will be successful.

The Proceedings of the Anamalai Planters' Association are published. They are of more local than general interest, but the amendments of the Local Rules regarding Labour might well be copied by other Districts. Such rules tend to good understanding and good fellowship.

We are only able to publish a portion of the Report of the R. G. A. Standardisation Report. It will be read with interest by all Rubber Planters.

Our Correspondence columns are unusually full of interest. Mr. Richardson has kindly forwarded for publication a letter from Mr. Manders. The absence of Southern India from the Exhibition will be very noticeable.

Two very important letters are published from Mr. Abbott. One was written to the *Madras Mail* but so important do we consider it that we have no hesitation in reprinting it. By a Labour Commission of their own can the Planting Community only combat the almost perfect organisation of the Ceylon Commission.

Scientific Officer's Papers.

CXXVI.—Nodules on Hevea Rubber Trees.

The information contained in this paper has been compiled and digested from the following sources of information which are duly acknowledged and those who are further interested in the subject should refer to the original articles.

1. *The Physiology and Diseases of Hevea brasiliensis by T. Petch.*
2. *The Tropical Agriculturist 1905.*
3. *The Ceylon Administration Reports. Report of the Director of the Royal Botanic Gardens 1910-11. Extracted in Planters' Chronicle VII. 43.*
4. *Royal Botanic Gardens, Ceylon, Circulars IV. 18. Abnormalities in Hevea brasiliensis.*
5. *The India Rubber Journal XLIV. 23 Pea Disease.*
6. *A Lecture to Kelani Valley Planters' Association, Ceylon, by T. Petch.*

Two kinds of burrs are formed on the stems of Rubber trees. The first are caused by wounds produced either by accident or by bad tapping. The use of a sharp toothed pricker which penetrates to the wood causes a burr to form. As a rule this formation does not offer any serious obstacle to tapping and it is not of much importance.

The second kind of burr is the formation usually known as a 'nodule' and these are of much more importance as they protrude from the stem and interfere with tapping. The bark is at first slightly elevated and forms a small hemispherical lump about the size of a pea, or in some cases the swelling is vertically elongated. If the lump is cut open there will be found inside a core of wood, either spherical or cylindrical, corresponding to the external shape of the swelling. These nodules are at first symmetrical without any projecting points and they have no connection with the wood of the stem. They lie wholly in the cortex being separated from the wood and cambium of the stem by ordinary lactiferous tissue. When the surface of the lump is cut away the cores shell out quite easily from the surrounding cortex separating from it along their cambium layer. In fact each core possesses a cambium of its own distinct from the cambium of the main stem and each can therefore increase in size by the addition of new wood to the core independently of the growth of the stem.

As the nodules increase in size the bark frequently cracks and it is at this stage that they are usually noticed.

A cross section through one of the cores shows that its nucleus consists of a small group of dead bark cells, or of 'stone cells.' A cambium is developed round this nucleus and this produces short wood cells and fibres arranged horizontally and more or less concentrically. This concentric arrangement is quite clearly seen when the core is cut across. The wood differs altogether from that normally produced in the main stem and closely resembles "wound wood,"

The cores of these nodules should be cut out before they attain any considerable size. It is then unnecessary to make a large wound. If the outside of the burr is sliced off the core can be shelled out quite easily. If

they are allowed to grow they become united at several points to the main wood and a big wound is the result of removing them. Consequently search should be made for nodules on young trees; they may be found sometimes on four year old trees.

If several of these nodules fuse they will form a large patch over which tapping is impossible as it simply consists of a lump of solid wood near the surface. The bark covering the nodules is deficient in, and sometimes entirely lacking, latex and consequently they should be removed when they are as small as possible.

No one has yet succeeded in proving any connection between the nodules and any disease caused by either an insect or a fungus. They have been attributed to many causes, but they are to some extent a normal feature of the Hevea tree, and similar structures are known in Apple and Pear trees and in the Beech and other forest trees in Europe. In Java nodules are said to occur on Ceara trees also.

They have been described as 'dormant buds' but these are connected with the wood of the stem which the nodule is not. Again the nodules have been described as "adventitious buds," but again such buds are continuous with the wood of the year in which they are produced.

Though they certainly do occur on trees which have never been tapped they are far more frequently formed after tapping and their formation is ascribed in a large number of cases to the use of pricking tools of the rotating spur pattern and they are most frequent on trees which have been pricked.

This appears to be borne out by the tapping experiments at Peradeniya, as in a Progress Report from 8 May to 10 July 1913 it is recorded that trees which were quite free after being tapped with the Northway serrated knife, cut 8¾ inch apart and full herringbone, became badly affected with nodules.

Overtapping, a high elevation, and dry weather, all appear to be definite factors in the production of burrs and nodules that is to say anything which tends to reduce the vitality of the tree.

RUDOLPH D. ANSTEAD,
Planting Expert.

Weights & Measures.

There is some malignant imp dogging the Weights and Measures Committee with intent to make the public sick or distrustful of it. It began its enquiry in this city in the midst of the financial panic when people would not believe in any kind of weight or any kind of measure, their money and their credit having gone to the devil. Nobody took any interest in the proceedings and nobody believed the enquiry would do any good. Last week the Committee published its tour programme through the Central Provinces, Bengal, Orissa and Madras. Now we are told that the Committee is marking time somewhere, waiting for the Government of India to appoint another President in the place of Mr. Arthur, the Bombay Civilian, who has to go home at once on account of ill-health. That is generally the way with official presidents. The Government of India were never in earnest in this enquiry, and I would not be surprised if they were to drop it quietly while people's minds are engaged with something more exciting.—*Capital.*

THE SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Weed killer.—In the *P. C.* for 22 November, Mr. J. G. Hamilton wrote asking whether the Scientific Department had any more information to give him about the use of Arsenite of Soda as a weed killer. I believe that several planters have tried it with good results, but they have not favoured the Department with any detailed account of their experiences.

The following account of some experiments carried out by the Assistant Inspector of Agriculture, New South Wales, as to the efficacy of arsenite of soda for killing weeds and grass on garden paths was published in the *Agricultural Gazette of New South Wales*, and may be of interest to Mr. Hamilton and other readers :—

"The experiment was arranged to test various strengths as follows :—

No. 1 1 lb. Arsenite of Soda to 2 gallons of water.
No. 2 1 lb. Arsenite of Soda to 4 gallons of water.
No. 3 1 lb. Arsenite of Soda to 6 gallons of water.
No. 4 1 lb. Arsenite of Soda to 10 gallons of water.

"The path selected was a gravel one, 100 yards long, the edges of which were covered with couch grass and small weeds. The experiment was carried out in December, the weather being hot and dry. The final examination showed that Nos. 1 and 2 killed the couch and weeds ; but Nos. 3 and 4 only partially killed them, and after the heavy rains they revived and are now growing vigorously. On Nos. 1 and 2 there was no couch at all, and only a few weeds, the seed of which were apparently washed there by the recent heavy rains.

"If the affected path can be raked prior to spraying, so much the better as this operation exposes the roots.

"The most opportune time to spray is in the heat of summer ; and if the work is done towards nightfall, the poison has a better chance of soaking in during the night and getting to work on the roots. The spray is very cheap, No. 2 costing 1s 3d per 10 gallons.

"An ordinary watering can may be used, but care should be taken to rinse it out with hot water after spraying. Care should also be taken to keep all stock off the treated area for a period of at least four weeks."

Ground Nut Poonac.—A sample of Milled Ground Nut Poonac has recently been submitted for analysis and was found to contain :—

*Organic Matter ...	... 94·44%
Insoluble Matter	... 1·51%
*Containing Nitrogen	... 8·53%

The Madras Government Chemist in his '*Note on the Indigenous Manures of* South India' published in 1912 gives the average Ground Nut Poonac as containing

*Organic Matter ...	... 93·25%
Insoluble Matter	... 2·53%
*Containing Nitrogen	... 8·04%

The average price is stated to be Rs.83 for Poonac containing 7·8% of Nitrogen.

Taking these figures as a basis, and they have probably changed very little if at all, calculation will show that a pound of Nitrogen in the form of Ground Nut Poonac costs 7·6 annas. Hence the above sample is worth Rs. 90-12-0 per ton.

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

North Mysore Planters' Association.

Proceedings of a Quarterly General Meeting held at Balehonnur on December 15th, 1913.

PRESENT.—Messrs. C. S. Crawford, A. F. Evetts, F. W. Hight, E. W. Fowke, R. G. Foster, E. Young, C. Danvers, C. C. Kent, H. G. Bonner, J. Saldanha, Thos. Hunt (President) and W. H. Reed (Honorary Secretary). *By Proxy:* Messrs. E. C. Bolton, E. Lund, C. P. Reed, A. Durham, S. L. Mathias, F. Parton, F. I. Morgan, E. C. Kent, Major Ricketts and L. P. Kent.

Dassara Delegate.—Mr. E. W. Fowke read his report as follows:—

Gentlemen,—As your Delegate at the Dassara I was to represent you in the following matters:—

Income Tax.
Kalasa Bridge.
Labour Act.

Income Tax.—This was strongly opposed and was therefore shelved by the Dewan till another year.

Kalasa Bridge.—This was not on the Agenda, so I could do nothing in the matter.

Labour Act.—In regard to this Act Mr. Lake, the South Mysore Representative and myself had an interview with the Dewan who informed us that the introduction or otherwise of this Act was not a matter for consideration at the General Representative Assembly, but must be considered in the Legislative Council. With a view to this a representation must be made by our District Associations to this body. The Dewan also gave us to understand that previously we did not wish for this Act, and that therefore nothing had been done, however he was in favour of some such Act being introduced and was willing to re-open the subject. We then said the Act without extradition was of no use to us, and we hoped before the Act was passed it would be submitted to the Associations for suggestions. The Dewan replied that before any Act was introduced as law it would be first submitted to the Planting Community.

The Indian Planters are also in favour of this Act and have asked for its introduction subject to certain modifications, the principle one being that the acreage coming under the Act shall be reduced from 10 to 5 acres, to include the small holdings.

When the question of the Labour Act was brought up at the General Assembly a Native Representative from South Mysore asked for extradition under Act 13 of 59. We then asked that instead of this we should be given Act 1, and our suggestion was supported by the Chickmaglur Native Planters' Association.

The Dewan replied that this matter was under consideration. On this, as there was no opposition, the matter closed.

These were all the subjects in which I was asked to represent you and I now beg to thank you for electing me as Delegate.

Yellneeru Ghat Road.—The following proposal was made by Mr. E. W. Fowke and seconded by Mr. A. F. Evetts: "That the British and Mysore Governments be approached through the Association and asked to construct a ghat road from Sumsay Village to Killur."—*Carried.*

Postal Delays.—Proposed by Mr. Hunt and seconded by Mr. Danvers: "That the attention of the Postmaster-General be drawn to the numerous delays that take place and ask him to take steps to prevent a repetition of these unnecessary delays."—*Carried.*

Viceroy's Address.—The expenditure on casket and address was sanctioned by the meeting.

Increase of coolies' pay.—Full discussion took place. The following proposals were put before the meeting: (1) Mr. Evetts proposed, seconded by Mr. Bolton, "That this Association do raise the pay of men to 5 annas and 3 annas to women from the 1st January, 1914."

(2) Mr. Danvers proposed, seconded by Mr. W. H. Reed: "That the pay of men coolies be raised to 5 annas and of women to 3 annas per day from the 1st March, 1914."

Mr. R. G. Foster then proposed the following amendment, seconded by Mr. C. C. Kent.—"It having been decided by members of this Association that a rise of pay is essential to keep our labour that the rise take place after February 1st, 1914, it being optional for individuals to make the date of increase later but not prior to February 1st."—*Carried.*

Rider proposed by Mr. E. W. Fowke and seconded by Mr. Danvers: "That the rates be raised to 5 annas for men and 3 annas for women."—*Carried.*

Rider proposed by Mr. Bonner and seconded by Mr. Danvers: "That the fact of N. Mysore raising rates of pay be freely advertised by printed circulars in S. Canara, etc., at the expense of the Association—the work to be given to the Codiabail Press." *Carried.*

Labour Commission.—The present position was discussed and the suggestion of the B. P. A. was approved. Mr. C. H. Browne was elected as delegate to attend the U. P. A. S. I. extraordinary meeting to be held in Bangalore.

Call on Benevolent Fund.—It was resolved: "That the Association recommend temporary assistance for the case put before the meeting. Messrs. Danvers and Bonner agreed to endorse the appeal.

Assistant for the Director of Agriculture.—The following resolution was put before the meeting by Mr. Hunt seconded by Mr. W. H. Reed: "That this Association requests the Government of Mysore to give the Director of Agriculture a trained European Assistant, and so enable his department to devote more attention to the numerous grave pests that are threatening the principal agricultural industries of the Province."—*Carried.*

Assistant Scientific Officer.—After much discussion it was resolved that legal opinion be taken on the agreement made between the Assistant Scientific Officer and the U. P. A. S. I.

Assistant Scientific Officer Fund.—It was resolved that in view of recent resignations, members are reminded that they cannot shirk their liabilities to the above fund by resigning the Association. All members who were members of the Association when it was decided to engage a Scientific Assistant will be called upon to pay their subscriptions for 5 years.

Election for Vice-Chairman.—Mr. C. P. Reed was elected.

(Signed) W. H. REED,
Honorary Secretary.

The Anamalai Planters' Association.

Proceedings of a General Meeting of the Anamalai Planters' Association held at the old Valparai Bungalow at 2 p. m. on Friday the 19th of December, 1913.

PRESENT.—Messrs. G. L. Duncan (Chairman), J. H. Ireland Jones, J. E. Scott, E. W. Simcock, C. Howland, C. R. T. Congreve, G. A. Marsh, R. Fowke, E. N. House, J. E. Sampson, and J. Hatton Robinson (Honorary Secretary).

Agenda.

1. TO CONFIRM MINUTES OF THE COMMITTEE MEETING HELD AT PARALAI ON 19/11/1913.

The Minutes of the Committee Meeting of 19/11/1913 were confirmed.

2. TO CONSIDER THE HON'BLE MR. BARBER'S CORRESPONDENCE WITH GOVERNMENT *re.* "THE TOWNSHIP."

The Honorary Secretary was asked to write to the Hon'ble Mr. Barber and thank him for the trouble he had taken on behalf of the Association and to ask him to convey to the Government Officials concerned the thanks of the Association for the support they had given to the movement.

It was decided that a clearing of about 50 acres should be started as soon as the money was granted and a working Committee comprising Messrs. Congreve, Scott, Robb and the Honorary Secretary, *ex-officio*, was formed to see to the same.

3. HOSPITAL SUBSCRIPTION.

A detailed Estimate giving the cost of working the Hospital for 1911-13 received from the President, District Board, was read to the Meeting.

In reply to his letter No. 1403 D/B of 1913 dated 17th November, 1913 —received from the President, District Board—the Honorary Secretary was asked to write and say that the Association would continue to pay their Subscription towards the Hospital—but the Meeting would like to point out that as there had been a Lower grade official in charge of the Hospital for some time past—that the charges for upkeep required from the Association ought to be materially less; and, that in agreeing to continue to pay its subscription to the Hospital that should the Association ever wish to withdraw from the existing arrangement—and make arrangements of its own —as suggested by the President of the District Board that it should receive from the District Board its proportionate share of the supplies and instruments stocked in the Hospital.

As requested by the President of the District Board—Mr. Duncan was asked if he would give his old Bungalow at Valparai for a temporary Hospital —in order to see if a more reliable Medical man could be got to remain in charge of the Hospital. Mr. Duncan said he would ask his Company to let the Association have the Bungalow as a temporary Hospital.

The Meeting hoped that should the old Valparai Bungalow be used as a temporary Hospital that the same did not mean any delay on the part of the Government in getting the *new hospital* built.

4. TO DECIDE TO WHAT EXTENT THE ASSOCIATION WILL GUARANTEE THE TELEGRAPH LINE BEING EXTENDED TO THE DISTRICT.

The Guarantee required is; for Valparai Rs. 350, Malayandipatnam Rs. 183.

After some discussion the following resolution was put to the Meeting.

Proposed by Mr. Robinson and seconded by Mr. Fowke;

"That the Telegraph Guarantee required (including the Malayandipatnam Office Guarantee if necessary) for bringing the line from Pollachi up into the District be guaranteed by the Association."

An amendment was proposed by Mr. Marsh and seconded by Mr. Scott:

"That the Association would guarantee the amount required as guarantee, provided the Post Office, and Telegraph Office were built on the Township site."

On votes being taken Mr. Robinson's proposal was carried.

5. (*a*) LOCAL LABOUR DIFFICULTIES.

(*b*) AMENDMENTS OF THE LOCAL RULES REGARDING LABOUR.

(*a*) Mr. Simcock brought two instances before the Meeting both of which he considered were violations of the existing District rules, by another member of the Association and wanted the opinion of the Meeting on the matter. The Meeting considered that there had been misunderstandings on both sides and decided that a Rule regarding Maistries ought to be framed at the next General Meeting.

(*b*) The following Rule regarding Check Roll Labour was passed unanimously.

That any Labourer *bona fide* employed as a Check Roll Cooly shall be bound to serve the Estate to which he first comes up for the period of the contract entered into by the Maistry or until such time as he is finally paid up and discharged, within a period of one year, and that in the event of his bolting to any other Estate, on being claimed by the Estate on which he originally worked he shall be returned without demur.

That any Cooly who comes to the Estate with a Maistry, who has taken advance as a Check Roll Maistry, shall constitute a Check Roll cooly until termination of the Maistry's contract.

This Rule to be in force until legal proceedings are instituted, in which case the order of the Court holds good—but due notice of legal proceedings shall be given in every case possible.

6. POLICE.—1. ESCORTS FOR MONEY. 2. EXTRA CONSTABLES IN CROP SEASON.

The Honorary Secretary was asked to write to the District Superintendent of Police, pointing out the necessity for Police Escorts being given when large sums of money are being brought up into the District; and also as to the necessity of extra Police being put on for Special Duty now in the Coffee and Cardamom Crop Season

7. TO ELECT A DELEGATE TO ATTEND THE JANUARY MEETING OF THE UNITED PLANTERS' ASSOCIATION OF SOUTHERN INDIA.

Mr. Duncan was elected to attend the Labour Commission Meeting in Bangalore.

With a vote of thanks to the Chairman for presiding, and for lending his old Bungalow for holding the Meeting in, the Meeting terminated.

(Signed) GEO. L. DUNCAN,

Chairman.

(„) J. HATTON ROBINSON.

Honorary Secretary.

R. G. A. STANDARDIZATION COMMITTEE'S REPORT.

The Testing Scheme.

The Report in Detail.

The full report of the Standardization Committee is as follows:—

Gentlemen.—At an Extraordinary General Meeting of this Association, held on 21st July, 1913, a Committee on Standardization, of which Messrs. Norman W. Grieve, Frank Copeman, H. A. Barrett, Herbert Wright, P. J. Burgess, G. Corderoy, R. Hoffman, Hon. Everard Fielding, McNair Scott, and Syril Faxendale are members, was appointed, the terms of reference being to consider a scheme (submitted by Mr. Herbert Wright) for a more accurate system of standardization and evaluation of plantation rubber, and for extending the use of plantation rubber. The details of Mr. Bamber's scheme were discussed, and it was decided to postpone, meanwhile, further consideration of this subject.

We now desire to submit a report and certain recommendations.

We think it desirable, by way of preface, to state that throughout our deliberations we have had in mind, as the sole object in view, the improvement of plantation rubber.

Meetings of the Committee.

The Committee has held frequent meetings, at a number of which manufacturers and manufacturing experts and technologists were present, and were kind enough to place before the Committee evidence regarding their experience and views on the questions before the Committee. The Committee has also received the views of other experts in writing, and individual members of the Committee have made a point of collecting confidentially as much evidence as possible in this regard.

The opinions and recommendations in this report therefore represent not only the views of your Committee and of individual members of the Committee, but also the experience and well-considered opinion of practical experts. Much of the evidence given is on record in writing, and part of this appears in the appendices.

General Remarks on the Evidence.

Your Committee desires to take this opportunity of thanking the various manufacturers, technologists and rubber experts who have been kind enough to place their views before it in person or in writing.

The Committee believed that there would be great difficulty in obtaining evidence from manufacturers, particularly as it was evident to the Committee that the interests of the producers, who are *sellers*, are in some respects by no means identical with the manufacturers, who are *buyers*. It was, therefore, a great source of gratification to the Committee that a number of gentlemen representing some of the very largest manufacturing concerns in the United Kingdom, and also in the U. S. A., came forward.

Your Committee thinks that the evidence which it has so collected is of the greatest value, more particularly as there was an almost unanimous consensus of opinion among the manufacturing experts to the effect that a system of accurate evaluation such as is recommended by the Committee would be approved by most manufacturers, and would certainly lead to a greater consumption of, and to a greater confidence in the plantation product. Of the total number of manufacturers, manufacturing experts

and technologists who appeared before the Committee or placed their views before it in writing, only one expressed himself against the scheme, but who objected to the publication of his views. As the Committee started with the belief that certain manufacturers, for reasons which need not be gone into, would be unfavourable to the proposals put forward, or at least would express themselves unfavourably, and that the bulk of manufacturers who were not unfavourable would probably express no opinion, it is clear that the highly favourable consensus of opinion from manufacturers and experts of standing which has been placed before the Committee is of the greatest value in supporting the views and recommendations put forward.

Variability of Plantation Rubber.

We consider the evidence which has been put before us clearly proves that variability of a substantial character exists, and that this variability exercises an important influence on prices generally. The formal evidence which has been tendered in this connection was amply confirmed by opinions collected privately by individual members of the Committee, and also by the personal experience and knowledge of certain members of the Committee.

We are of opinion that, while greater uniformity in methods of preparation on the plantations will lead to more uniformity in the finished product, there must always be some appreciable variation, owing to the fact that the quality of the latex varies.

We are satisfied that the variability which exists is sufficient to prevent manufacturers from using our product to the extent they would if some guarantee of quality could be given to counteract this variability.

We believe that a guarantee of quality would, by leading to a greater knowledge of and confidence in the product, popularise plantation rubber, and that this would, by increasing the demand, result in the maintenance of better average prices. We are convinced that most of the other grades on the market could not successfully compete with plantation rubber sold under a guarantee.

Practical steps for counteracting variability.

1. *Uniformity in Methods of Preparation.*—We have already indicated that greater uniformity in methods of preparation should be obtainable on the plantations, and that these should lead to greater uniformity in the finished product. In this connection we have carefully considered the steps which may be taken in this direction.

We believe that by issuing a schedule of instructions, such as are outlined in Appendix "G" that some, although slight, immediate improvement might be obtained. We recommend that a schedule on these lines be issued to the members of the Association. In making this recommendation, however, we desire to point out that actual improvement in regard to greater uniformity can only come about very gradually, and that, for reasons already stated, it is not to be expected that improvement in this direction can ever be of such a character as to make variability a negligible factor. Nevertheless, the Committee is convinced that the adoption of more uniform methods of preparation on the estates will, in course of time, tend to reduce the variation in the finished raw product. It is also anticipated that the instructions now issued may subsequently be considerably enlarged, when the preliminary difficulties have been overcome.

2. *Standardization on basis of certificate of quality.*—After very careful consideration, we have come to the conclusion that the most practicable and real method to counteract variability, to overcome the lack of confidence among buyers, and to maintain the price of plantation rubbers

generally, is that sellers should issue a guarantee certificate of quality based on approved tests.

We believe that sellers, by guaranteeing their rubber in this way, will materially add to their powers as competitors against sellers of all other grades, and that they may, ultimately, raise the price of first grade plantation rubbers to the level of, or above, "fine hard" Para.

Present System Inadequate.

We consider the present system of valuation by brokers as inadequate for a product of such importance as plantation rubber.

We are of opinion that prices to-day have no direct relationship to quality, and that it is impossible to determine by present methods alone the value of the vulcanized article. Evidence has been given privately to the effect that rubber of inferior quality is frequently described as first quality plantation, to the detriment of the latter's reputation, and that some manufacturers who are in a position to test all rubber before making a bid, are constantly able, to the disadvantage of plantation companies, to buy at low rates rubber classed as lower grade by brokers, though really of superior quality. The scheme which we recommend would necessitate the using of brokers' services as before, but to all brokers' descriptions of consignments would be added a figure of quality certified by a testing station.

We believe that the present system results in :—

(1) Same value being given to rubbers having entirely different qualities;

(2) Really good rubber being often sold at a discount, or replaced by some material of inferior quality;

(3) Dissatisfaction and loss of confidence among manufacturers;

(4) The best rubber not always getting the best price;

(5) A narrowing of the real market for our produce.

Advantages of Standardization by issue of Guarantee Certificates based on approved Tests.

The advantages which would accrue to the plantation industry would in our opinion be :—

(1) That each lot of rubber would be sold on a real basis of quality, and would receive its proper price;

(2) The scheme would enable sellers to determine and appreciate the value of their rubber, and therefore to fix the price on a real basis of value;

(3) Manufacturers could repeatedly buy without anxiety or risk, due to the acknowledged variability of our product, the same grade of rubber required by them;

(4) A much closer price would be bid for all grades of plantation for which a guarantee of quality was assured;

(5) Plantation rubber would rapidly become the most popular form for manufacturers, and ultimately perhaps would be used to the exclusion of all other grades;

(6) There would be an increased demand for our product, which would eventually be reflected in prices;

(7) Greater competition among the proprietors and planters to produce better rubber, thus raising the standard of general quality and value. That is to say, plantations producing wholly, or in part, unsatisfactory grades would necessarily be forced to do their utmost to improve quality, and would have a proper standard of value to work to. This alone should result in better prices.

The evidence before us leads us to believe that the present average prices, and the prices which have obtained for a year or more, are, and have been, in the absence of a proper basis of value, much too low, compared with the finest wild rubbers on a proper basis of value.

We are strongly of opinion that the introduction of a system of testing which would clearly indicate quality to the buyer and value to the seller, would result in a material appreciation of prices all round compared with prices for finest grades of wild rubbers.

We believe that on a basis of actual quality, comparing plantation rubbers as a whole with "fine" Para grades, practically the whole of our first grade and second grade qualities are being sold far below their value; the bottom grades are almost invariably sold for whatever buyers offer.

We believe that by adoption of the scheme which it outlines in this report, the commercial quality of many plantation grades will be found to be higher than high-price wild grades; this, together with a knowledge of the amount of "loss in washing" to which all wild grades are subject, should react favourably towards plantation rubber.

(*To be continued*).

Extracts from Evidence before the Coast Agency Committee.

Assistant Commissioner.—"This Budget has been compiled on the suppostiion that the acreage cess may be increased to a suitable figure to increase the scope of the Commission. Under salaries account it covers the cost of two extra Assistants, one for the Madura Circle and another for North and South Arcot, leaving the Assistant of the Chittoor Circle to confine his attention entirely to the Telugu country. A sum of Rs.3,000 is provided for the appointment of two European Non-Commissioned Officers to undertake Agency Inspection entirely, thus enabling Assistant Commissioners to confine their work to the supervision of recruiting, advertising Ceylon, and obtaining useful information as to available labour, etc.

"The present increase would provide for an extra Assistant to be posted to the Madura—Tinnevelly Circle and it will then be possible to arrange that all European Assistant Commissioners with the exception of the Deputy who is posted to Headquarters should confine themselves entirely to the supervision of recruiting, advertising Ceylon in the Recruiting Districts, and obtaining useful details as regards labour available, etc., being

entirely relieved of systematic bi-monthly Agency Inspection which occupies six months of the year. To provide for these systematic inspections which are absolutely imperative for the protection of the finances of this Commission, I propose to undertake these directly from Head Office appointing Subordinate European Inspectors for the purpose who would be drawn from pensioned Non-Commissioned Officers who have had experience in Regimental Office work and who are well recommended by the Military Authorities. I do not anticipate any difficulty in obtaining the services of suitable men on moderate salaries. Two or three of these Subordinate Officers would carry out all the cash checking and inspection necessary at present at the Out Agencies of this Commission, and this can be undertaken monthly instead of bi-monthly as in the case at present, which extra supervision is eminently dsirable.

"With an increased cess and with consequent increase to my staff I propose to contract the Circles which the Assistant Commissioners control rather than enlarge them, which will enable them more efficiently to carry out their work, staying longer periods in the various places, more carefully supervising Kanganies recruiting and obtaining valuable information as regards labour available in the districts under their control. It is absurd to suppose that the Assistant Commissioner for instance of the Chittoor circle which comprises the whole of the Telugu Districts can do anything appreciable in the way of advertising Ceylon owing to the vast extent of the country under his charge. At the present moment owing to an incomplete staff the whole of the Madura and Tinnevelly District have been left out from the general scheme of work to be undertaken by the Assistant Commissioner's Agency, inspection being done as opportunity admits, but no Kangany supervision or advertisements is being undertaken as it is not possible to do so. Madura and Tinnevelly as my Committee are well aware are very old Tamil Districts from which Ceylon has for years drawn valuable labour connections through the medium of Kanganies. It is an undoubted fact that for various reasons we have lost ground in these districts, particularly in Tinnevelly, and I feel sure that it will be a great benefit to recruiting if the improved conditions which are gradually obtaining in Ceylon and of which I hope to see further progress during the course of the next year or so, and other attractions such as the Indo-Ceylon connection can be thoroughly ventilated in the villages, as I feel sure that thereby we shall be able to re-establish a footing in the two districts where labour is of such a good type.

New Agencies.—"Provision is also made for two extra Agencies in the Telugu and Coimbatore districts respectively. These Agencies will only be opened if recruiting shows an appreciable increase, thus justifying the increased expenditure.

Travelling Agents.—"Twelve travelling Agents have been estimated for to undertake extensive advertising and supervision of Kanganies recruiting, under the control of the Assistant Commissioners of their respective Circles.

"From figures before me I consider that the increased funds will not only pay for the services of an Assistant and his travelling but will enable me to increase my Head Office Subordinate staff as previously suggested for Agency Inspection work. If funds at my disposal are augmented at the beginning of the new financial year as I intend to seek I propose to put into effect my original system of Indian Travelling Agents for Kangany super-

vision and advertising Ceylon, etc., further amplifying the work of my Assistant Commissioners and under their control. A staff of these Agents efficiently controlled and in continual touch with my Assistants would, I consider, invaluable. I would draw these men from the very districts where our interests are involved picking them from the relatives or connections of District of Village Officials so that the ready co-operation of the latter in our work can be secured. Since I arrived in South India I have been gradually evolving this system in my mind that will gradually throw a net-work over the face of the recruiting districts of South India, so that eventually there will not be a single portion that does not feel our influence for the encouragement of recruiting and the protecting of our interests with the South Indian Government. At present there are many parts of South India where the Ceylon Labour Commission does not exist and there are cases where recruiting is being done for Ceylon irrespective of the Commission and at times to the detriment of Ceylon recruiting as a whole. As I have said before it is only the lack of funds that has prevented progress being made in this system during the last year details of which I placed before my Committee at the commencement of the year. I may safely say that the machinery of this Commission is now on such a good footing that funds devoted for the increase of its scope may be given with confidence that the utmost care will be given to secure an adequate return for the outlay. One branch of the work of the Commission which for the last seven or eight years has been almost entirely lost sight of is advertisement, and it is only during the last year that anything in this way has been done although even now it is not in any way consistent with the demand for labour which is daily increasing. We are very much behind the Straits and other countries in this respect; for instance there is not a single advertisement to attract labourers to Ceylon on any of the Railway systems of South India. This matter I propose to remedy during the forthcoming year and I now have the matter in hand. Similarly, advertisement in the villages except through the medium of Assistant Commissioners which only touches the fringe of our requirements, has been undertaken. From my recent tour in Coimbatore, I am quite sure that advertisement is and will be of the utmost value. The attractions that Ceylon can afford properly advertised in the recruiting districts through the medium of this Commission by posters notifying these conditions certified by the Commissioner is bound to do a great deal to counteract untrue and malicious statements circulated by those antagonistic to our work in South India."

Increase considered to be a Final One.—"In submitting Budget 'B' for the consideration of your Committee I would point out that in the event of this expenditure receiving their sanction I do not anticipate that any increase need be looked for in future years, as I consider that any further outlay should be devoted to some direct recruiting scheme and the present estimate should be approximately sufficient to cover the cost of dealing with all labour recruited under such a system.

"Irrespective of any definite recruting scheme, expenditure on Budget 'B' if sanctioned will enable me to extend the scope of the Commission to a very great extent for the supervision of existing recruiting and a satisfactory return of the outlay can be looked for in this respect: at the same time, the increased outlay will enable this Commission to cope with a great deal more work than is being dealt with at the present time."

Emigrant Cooly Depôt in Colombo.—"Estimates include a sum of Rs.1,200 for this purpose."—*The Weekly Times of Ceylon.*

CORRESPONDENCE.

Peermade, South India,
1st January, 1914.

International Rubber Exhibition.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—On the 27th November I wrote through the medium of the *Planters' Chronicle* stating that I had heard from the Directors of 5 Rubber Companies and one private proprietor offering support to the above exhibition. My letter has either passed unnoticed or has failed to bring any response. At the same time I also wrote to Mr. Manders that I had very little hope of united action in the matter unless Directors and Agents at home took it up. I enclose his reply which speaks for itself and I think with the present state of the rubber market and the efforts that are being made to standardise the manufacture of raw rubber Southern India will be making a great mistake if it is not represented.

The Exhibition is to include all Tropical Agricultural Products and if Coffee, Tea, Rubber, Cardamoms, Cocoanuts, &c., combined, the cost would be a very small tax compared with the benefits to be gained.

One large Firm in Southern India is putting up their own Exhibit and as I have already stated several London and Edinburgh Companies have promised support and have written me again by last mail asking what is being done.

This I think should be sufficient indication for Managers out here to decide on. The London people are in the best position to know the value of the exhibition and if they consider it advisable to support the scheme I do not think we are doing our duty by our Companies and Proprietors if we do not back them up.

If nothing is done it will be through sheer slackness and want of combination which is becoming proverbial of the South Indian planter.

We have declared acreage of somewhere about 140,000 acres and a two-anna cess if only half of this came in would put up quite a good show.

At the United Planters' Association meeting we were told that several South Indian planters were going home and wanted season tickets and introductions to the Exhibition Club but it seems to me they can expect scant courtesy if they refuse to support the scheme.

Besides sending this to the *Chronicle* I am addressing it to Honorary Secretaries of Associations in hopes of raising a little interest before it is too late on a matter which our home authorities think is of importance.

Personally I think we should cable for space, ask Mr. Anstead who I believe is going home if he would undertake to form a Committee of planters likely to be home next year to make arrangements on that side.

I would ask Honorary Secretaries to circulate a proposal asking for a 2 anna cess towards the Exhibition and if we can raise £ 500 go on with it and if not give it up and plead absolute want of interest in our own affairs.

Yours faithfully,
(Signed) J. A. RICHARDSON.

Copy of letter from Mr. Staines Manders.

Exhibition Offices,
75, Chancery Lane (Holborn),
London, W. C.,
8th December, 1913.

Dear Mr. Richardson,—Well, if the Planters of Southern India do not exhibit they will be making a great mistake; what an opportunity is offered through this exhibition! they can exhibit all other products besides rubber.

Some thirty-five Governments will be exhibiting.

Harrisons and Crosfield have taken a large space on which they will show rubber from some of their Companies, one of which is I think the Malayalam Company, but my suggestion is not to show rubber alone, but all products grown in the soil in your part of the world. It will be some 5 years before a similar exhibition is held.

The rubber Growers Association are taking a very active interest in the Exhibition and are helping in every possible way. The British Cotton Growing, and other Associations are helping in the same direction, and I give you my personal assurance that it will be one of the finest exhibitions ever held in Europe, of tropical and sub-tropical agricultural products.

I know that you will do all you can to see that Southern India is represented. I am not appealing on account of space letting, as the Exhibition is so well let up, but I wish to get in as many of the British Countries as possible; at present the foreign ones predominate.

Great Britain so far is represented by:—

Ceylon, British Honduras, British Guiana, St. Lucia, St. Kitts-Nevis, Antigua, Dominica, St. Vincent, British Malaya, British North Borneo, Queensland, Fiji, Uganda, Suden and Egypt.

Foreign, so far we have:—

The Federal Government of Brazil, State Governments of Sao Paulo, Para, Bahia, and Manaos, the Republics of Bolivia, Columbia and Guatemala, Evey French Colony, Java, Dutch Guiana, Germany, Belgium and the Belgian Congo.

Others are negotiating.

Surely after this, if you can make this information known, it should awaken some interest, so that a display of all products raised in Southern India may be arranged.

Yours truly,
A. STAINES MANDERS.

Meppadi, 6th January, 1914.

Labour Commission.

F. Norton, Esq.,
Secretary, U. P. A. S. I.,
Bangalore.

Dear Sir,—I have read Mr. Newcombe's two letters in the *Chronicle* with a feeling of depression. I am glad they were published because they show how the business strikes some men, or at least one man. I will not attempt to answer him, but I would ask you to publish the Proceedings of the last Meeting of the Ceylon Planters' Association in the *Chronicle*, or at least "The Extracts from evidence before the Coast Agency Commission." This shows that the Ceylon Planters intend to increase their subscription to their Labour Commission by 50% and contains a plain statement of what Mr. Nicholson means to do with the money, Rs.245,000 a year.

I hope there are not many planters who believe as Mr. Newcombe appears to, that the proposed South Indian Labour Commission was started and is being engineered by the large companies for the purpose of taking away coolies from small private owners.

To a member of the Executive Committee who knows the line taken by some of the large companies, the notion appears grotesque.

Since I read the above-mentioned Proceedings I have had reliable information that 2 Estate Agency Firms in the Straits have combined to establish an expensive Recruiting Agency in South India and that two large Rubber Companies there intend to establish another.

Yours faithfully,
C. E. ABBOTT.

Kesinvurthy Estate,
Santaveri, Birur M. S. M. Ry.,
January 7th, 1914.

Green Bug.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—I read with interest Mr. Cayley's letter about Green Bug on the Shevaroys, and from what he says, no one can, I think, say that it does comparatively little damage on the Shevaroys. Perhaps some other sufferers on those hills will kindly give their experiences.

I will not argue with Mr. Cayley about Borer, although I have had, unfortunately, many years' experience of it, but I can only say that if we on these hills are unfortunate enough to get the bug, and it has such a predilection for coffee trees that have ever had a touch of Borer, it is a poor look out for us. But what of the Nilgiris, surely some of the high estates that were wiped out by G. B. had never been troubled by borer?

I have been told that G. B. has disappeared from the Pulneys. Is this so? Will not some Pulney Coffee Planter enlighten us on the subject? Everyone knows that debilated trees suffer most from any disease that is present or may come along. I was told, however, that on one Estate it had attacked the finest and most luxuriant coffee.

Yours faithfully,
G. R. OLIVER.

Meppadi, 2nd January, 1914.

The Proposed U. P. A. S. I. Labour Commission.

THE EDITOR,
Madras Mail,
Madras.

Sir,—The last Proceedings of the Ceylon Planters' Association reported in the *Times of Ceylon* ought to interest those planters in India who are still hesitating about supporting the Labour Commission, as well as those, especially in the Southern Districts who have refused to join on the ground that they are able to get all the coolies they want without assistance.

The Ceylon planters intend to increase the present acreage subscription by 50 per cent. in order to carry out the proposals put forward by Mr. Scoble Nicholson, the Ceylon Labour Commissioner.

The actual decision was postponed till February. But there does not appear to be much opposition, and there is little doubt that in a few weeks the Commissioner will be in a position to spend Rs.245,000 a year on his work. It must be borne in mind that Mr. Nicholson has no heavy preliminary expenses to meet. The Ceylon Commission has been established for several years, so the whole of this sum will be spent on supervising recruiting, advertising Ceylon and obtaining information as to available labour in new Districts. The whole of his letter explaining his plans to his Association is worth careful study by planters in this country. Perhaps you will allow me space for a few extracts.

Special attention is to be devoted to the Madura and Tinnevelly Districts. "It is an undoubted fact that for various reasons we have lost ground in these Districts especially in Tinnevelly." It is another undoubted fact that these are the only Districts where an organised Commission (Mr. Martin's) recruiting for Indian Estates exists.

Mr. Nicholson continues: "I feel sure that it will be a great benefit to recruiting if the improved conditions which are gradually obtaining in Ceylon and of which I hope to see further progress during the course of the next

year or so, and other attractions such as the Indo-Ceylon connection can be thoroughly ventilated in the villages, as I feel sure that thereby we shall be able to re-establish a footing in the two Districts where labour is of such a good type."

Twelve travelling Agents are to be appointed for Kangany supervision and advertising Ceylon. "I would draw these men from the very Districts where our interests are involved picking them from the relatives or connections of District and Village Officials so that the ready co-operation of the latter in our work can be secured. Since I arrived in South India I have been gradually evolving this system in my mind that will gradually throw a net-work over the face of the recruiting Districts of South India, so that eventually there will not be a single portion that does not feel our influence for the encouragement of recruiting and the protecting of our interests with the South Indian Government."

Further on he writes, "one branch of the work of the Commission which for the last seven or eight years has been almost entirely lost sight of is advertisement.....there is not a single advertisement to attract labourers to Ceylon on any of the railway systems of Southern India... "From my recent tour in Coimbatore I am quite sure that advertisement is and will be of the utmost value. The attractions that Ceylon can afford properly advertised in the recruiting Districts through the medium of the Commission by posters notifying these conditions certified by the Commissioner is bound to do a great deal to counteract untrue and malicious statements circulated by those antagonistic to our work in South India."

Special attention is also to be devoted to the Telugu Districts and two Assistant Commissioners are to be in charge of them. Any Delegate to the U. P. A. S. I. who took a ten minutes walk from his hotel in Bangalore saw the Ceylon Labour Commission's Building. So our Canarese coolies are being attracted to the Island.

Well, there is the plan of campaign of an able and straightforward rival for the Planters of South India to contemplate. I am one of the Executive Committee appointed at the Bangalore Meet to carry out the recommendations then made about starting a Labour Commission of our own. We have received some whole-hearted support for which we are grateful, some definite refusals and a great deal of criticism. Two districts affiliated to the U. P. A. S. I. have declined *en bloc* to join. After four months' hard work the Committee is considering if the acreage promised justifies it in recommending that a start should be made.

In many Districts the year 1913 has been the worst for labour that Planters have known. There is no particular reason why 1914 should be any better. Rates of coolies' pay in the Straits have been reduced, or tasks greatly increased; but the coolies that have gone there have not the means to return, and can only accept the terms that are offered them. Are the majority of the planters content to sit still with this prospect before them? The Ceylon Kangany when he returns to his village will be shepherded and kept up to his work by "the relatives of the District Officials," and assisted by them when in any difficulty: while there will always be an Assistant Commissioner within easy call to protect his interests with "the Government of Southern India." Meanwhile our Kanganies are to be left to their own devices, and no doubt obstructed in their work by the same relatives.

Does the South Indian Planter like the programme now frankly published by Ceylon? Is he going to support his own Commission, or does he prefer the alternative that was offered 150 years ago to Commodore Trunnion?

Your obedient Servant,

C. E. A.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department publishes an interesting article on various subjects. A Fungoid Disease of Coffee should be read carefully and the instructions followed. Those who have had experience with Nursery Bamboo Baskets will be doing good service if they will forward them to the Planting Expert for publication.

America is so far ahead in the important matter of research work that we draw attention to what the Scientific Department writes on this subject. We draw special attention to the difference of the amount spent by the United States on Agricultural Department and that spent by the U. P. A. S. I. on similar work.

Those wishing to communicate with the Scientific Assistant (Mysore) are requested to note that for the future his address will be Ootsey Estate, Mudigere P. O, Kadur District.

We conclude in this issue the R. G. A. Standardization Committee's Report, which will be read with interest by all Rubber Planters.

We do not often receive verses but we have great pleasure in publishing those from A. Ff. M. a true lover of Nature.

The Labour Commission still occupies men's minds and we publish two letters which bear on the subject. We may here say that the Labour Committee will meet at Ootacamund on the 17th instant and after, to consider the whole question and to draw up their Report for the Extraordinary General Meeting. What that report will be depends entirely on the support that has been promised to the Scheme. But we have no doubt that every letter and suggestion will receive the earnest attention of the Committee. The delay that has occurred has been unavoidable for much correspondence has been entailed, and every suggestion has received due consideration.

Last week we reprinted the Ceylon Labour Commission Budget Scheme which should have been read together with Mr. Abbott's weighty comments.

"Dyspeptic's" letter amplifies Mr. Abbott's comments but without the whole-hearted support of the Planting Community how can these suggestions be carried out. The Committee can only do their best with the materials they have. Mr. Hayward will shortly have the opportunity he wishes for.

THE SCIENTIFIC DEPARTMENT, U. P. A. S. I.

A Fungoid disease of Coffee.—During the past year, on an estate in Coorg, a number of Coffee trees were found to have a white covering of mould at the collar which, as soon as the rains came, rapidly developed into a close white web covering a considerable portion of the base of the stem. This had a deleterious effect upon the trees, making them generally unhealthy looking with a tendency to drop their leaves and crop. A specimen was sent to Dr. Butler, the Imperial Mycologist at Pusa, who very kindly studied it and said that he had not previously seen this disease and found it difficult to get the fungus to grow in such a way as to permit of its identification. He reported as follows: "The stump was rotted by the attack of a fungus which causes the cortex to become flaky and easily detached. Fine hyaline hyphae were found in the tissues and between the flaky layers of cortex. Externally there are a few white strands which no doubt belong to the parasite. The fungus itself is white and the detached cortical layers are whitened, while further in the wood is slightly darkened. No fructifications of any kind were observed, even after prolonged incubation, but from the structure of the rhizomorphic strands, and the presence of 'clamp connections' in the mycelium there is little doubt that the fungus is a basidiomycete."

Since this report was written Dr. Butler has informed me that he is now getting some promising cultures of the fungus and may be able to name it later on. In the meanwhile it appears very similar to a disease described by Ridley in the *Agricultural Bulletin of the Malayan Peninsula 1897, No. 7. p.147.* where the fungus causing it is called *Irpex flavus.* This fungus Dr. Butler informs me has many names, *Polyporus flavus* being used in some recent publications as correct.

The following is the description given by Ridley:—

"Another fungus disease attacks the base of the stem and roots (of coffee) quickly causing the death of the tree. In this case it will be noticed that the chief symptom is the thickening of the bark on the larger roots and at the collar at the base of the tree. The bark becomes corky, and whitish and irregularly cracked, or scaly. A section under the microscope shows that the cambium layer, between the bark and the wood is black, and the mycelium of a fungus has crept through it and often has traversed a portion of the wood as well, marking its course by a black line. When the fungus has completely encircled the tree, it is of course quite killed."

"One of the remarkable points about this disease is that it occurs in patches in the coffee plantation, and does not seem to spread. All the trees in the patch may be killed, and young healthy trees planted there perish very soon. From this it appears clear that the fungus is in the ground, in the form of mycelium or as it is often called spawn. On a tree which had been destroyed by this fungus and then pulled up and thrown away I found a quantity of a species of *Irpex*, namely, *I. flavus*, fully developed at the base of the stem and at other points where traces of damage from the mycelium could be seen."

"This fungus is a leathery white irregular mass of no great thickness firmly attached to the bark of the tree, covered on the lower side with small sharp points of a canary yellow colour when fresh. This was I think the spore producing part of the fungus (Hymenium) and serves to identify the plant."

"This fungus probably establishes itself in the ground from the fallen trees destroyed in clearing and left to decay. All coffee trees affected by it

should be burnt, and lime should be dug plentifully into the ground where the coffee refuses to grow. In Europe where some of these fungi do much damage to the trees, it is recommended to dig a trench a foot and-a-half deep round the affected spot and fill it with lime, to prevent the fungus from spreading, and then treat the area with lime."

In many particulars this agrees with our experience in Coorg and it would appear that if the fungus present is not *Polyporus flavus* it is something closely allied to it.

At present it is not known how much damage it will finally do, but it certainly makes the trees attacked very unhealthy. The remedial measures recommended are to scrape away the soil and mulch from the base of the trees and let in as much light and air as possible and to paint the affected stems with Bordeax Mixture.

Tapping Hevea.—The Monthly Bulletin of Agricultural Intelligence and Plant Diseases for September 1913 contains an account of some experiments conducted in Java to investigate the influence of the position and slope of the incision on the yield of latex when tapping Hevea Rubber. It was found that incisions of equal length made at equal heights on the tree and in the same direction placed two inches apart all gave the same yield, but two incisions gave some 20% more latex than a single incision at the same height equal in length to the sum of the lengths of the two separate incisions. It was also found that left hand tapping gave 14% more latex than right hand tapping. The following conclusions were arrived at as a result of the experiments:—(1) That Petch's hypothesis that left hand tapping usually yields more latex than right hand tapping, because the fibres of Hevea are not absolutely vertical, is a rational one. (2) That as a method of tapping the half herringbone to the left is preferred to the herringbone or half herringbone to the right. (3) That the ideal angle for the incision would be at right angles to the latex tubes, but as the incision would then be almost horizontal, some arrangement like a gutter would be necessary to guide the flow of the latex into the collecting cup.

Nursery Bamboo Baskets.—A correspondent complains that ordinary bamboo baskets placed on the ground in a nursery and watered daily rot so rapidly that many plants are lost, and wishes to know how this can be prevented. I should be glad to hear the experience of other planters on this point to which my attention has never been called before, and in the meantime would suggest that the baskets be placed on a bed of six inches or so of coarse gravel or rubble to ensure good drainage at the bottom, and to prevent them standing in stagnant water. The latter must detract from the growth of the seedlings and the soil in the baskets should be kept well drained and aerated. It is possible that the bottom of the baskets might be tarred, or dipped in solignum, without harm to the plants afterwards grown in them. If anyone has experimented along these lines or taken any special precautions to prevent the too rapid rotting of baskets in the nursery, he will be conferring a favour if he will let me know what method he finds the best.

The Necessity for Research Work.—In his Administrative Report for 1912-13 the Government Entomologist has something to say about Research Work which applies to the U. P. A. S. I. as much as to the Madras Agricultural Department, and raises a point too often overlooked by the ordinary planter who has no scientific training. The Entomologist says, "it may be laid down as an axiom that no man, no matter how hard working and able, can give adequate attention at one time to more than one branch of work,

and so long as there is only one Entomologist, his time must be taken up with routine work, and any adequate research on pathological work must remain practically untouched until other workers can devote themselves to these subjects."

"Very hazy ideas exist on the subject of research, and it is often imagined that a man, whose time is mostly occupied with routine work, can devote any odd half hour to research. Nothing can be more absurd. Research for any useful results to be attained, must absorb the whole of the researcher's time and energy. Nor must it be imagined that research can be carried out by anyone, for it is certain that only a very limited number of workers are fitted to carry out research."

The Entomologist goes on to point out that it needs no arguments to prove the value of research, which is defined as being, "the addition to previous knowledge of new facts," and among the examples of directions in which research is needed he includes the case of Green Bug. "In some districts of Southern India coffee has been practically wiped out by Green Bug (*Lecanium viride*), whilst other districts in which this insect occurs seem to suffer little damage. Research on the causes underlying the successful increase of this pest would well repay itself."

United States Agricultural Department.—In America the value of science and research work to agriculture and the nation as a whole is fully recognised with the result that the United States Agricultural Department is a model for the rest of the world. In his Report for 1913 the Secretary of Agriculture says that, "when the Department of Agriculture was first organised, and for many years thereafter, its work was confined to matters directly affecting agriculture. Congress has, however, more recently enacted legislation charging the department with the enforcement of numerous regulatory laws, including those relating to meat inspection, animal and plant quarantine, food and drugs, game and migratory birds, seed adulteration insecticides, fungicides, &c., many of which only indirectly affect agriculture."

During the year a sum of nearly 25 million dollars was allotted by Congress to carry out the work of the department, and of this 15 millions were spent on regulatory work, and the remaining 10 millions on scientific research, experiments, and demonstrations directly affecting the farmer. It may be noted in this connection that the population of the States is less than 95 millions, and that out of a total of 935 million acres of arable land, 400 millions only are included in farms and improved, and over 100 million acres are unimproved and not included in farms, the balance of 435 million acres being included in farms but unimproved. The Agricultural Department therefore may be considered to cost about 13 as per head of population or 3 annas per acre of improved land. Somewhere in the neighbourhood of the opposite extreme is the U. P. A. S. I. who with an acreage of 106,000, excluding Coorg and Mysore, spend less than Rs.4,000 on their Scientific Department, or 7 pies per acre.

Scientific Assistant for Mysore.—During January and February Mr. Frattini will conduct some demonstrations with Messrs. Nobles' Agent on the use of dynamite in agriculture; its use for tillage, subsoil tillage, and removal of stumps being more especially investigated. He will also make a tour in the Bababudins and North Mysore. During February and March he will be chiefly occupied with laboratory work and the analysis of a limited number of soils and the checking of guarantees of fertilisers supplied to Mysore planters.

R. D, A.

R. G. A. STANDARDIZATION COMMITTEE'S REPORT.

The Testing Scheme.

(Continued.)

POSSIBLE OBJECTIONS.

(A) Brokers and dealers may object to any delay in delivery of certificates. This objection is easily overcome as in the case of sugar and other products, where the sale is made subject to certificate. The Committee do not see any serious grounds for this objection, especially as the certificate can be issued within two or three days, and sales may take place, in future, at longer intervals.

(B) Manufacturers who are in the habit before making any bid for plantation rubber of subjecting it to various tests, would not welcome the scheme, because it would enable the sellers to determine the value of their produce before concluding a sale. One representative has, however, been candid enough to admit that it is time the sellers did it for their own protection. This particular firm of manufacturers would, however, we anticipate, accept the certificate of the Technical Bureau when once they had convinced themselves of its fairness, though they would have to pay a higher price for the rubber they purchase.

(C) Those companies who have sold forward for next year, assuming the scheme to become operative for that period, would not wish to contribute for that portion of their crop so dealt with. This objection we regard as insignificant, and do not anticipate that companies who see the necessity of co-operation would stand in the way of the scheme.

(D) The difficulty of testing the large number of samples which will be sent in. The Committee believe that the special method of testing referred to later is such that this difficulty can be overcome.

The idea of issuing a certificate of quality is not new in the commercial world. It has been adopted for many years with wool, coal, etc., and in the opinion of this Committee a satisfactory scheme can be evolved to deal with all grades of rubber, whether disposed of by private treaty or auction sales. In order to furnish your Council with details showing how other products are dealt with, particulars have been collected and will be found in Appendix.

GENERAL NATURE OF TESTING (STANDARDIZATION) SCHEME.

It is proposed to rent a central testing station, which shall examine and issue a certificate of quality corresponding to every half-ton of rubber delivered. The tests, which will be of an entirely practical character, will be put through within two days, if necessary, of delivery of samples. The latter will be vulcanized under certain standard conditions, and tests applied to the vulcanized material. On the basis of these tests a certificate will be issued, which will clearly indicate commercial quality on a comparable scale.

It is also proposed to erect, in conjunction with the testing station, an experimental factory, the objects of which are referred to in some detail below.

ORGANIZATION.

In order to carry out the work a central building, equipped, with boilers, washing and drying plants, mixers, calenders, vulcanizing plant, moulds, motors, testing apparatus, etc., will be required. The complete scheme which we recommend provides for a division into (1) testing station,

and (2) factory; the former being essential and the latter eminently desirable.

Testing Station.

The testing station will be concerned with testing samples of raw rubber and the issue of certificates relating thereto as stated.

Factory.

The extra capital cost of the experimental factory would be small when combined with the testing station, as a considerable part of the plant, buildings, etc., would be available for both purposes; the same remark also applies to upkeep charges for the factory. We have reason to believe that some manufacturers would avail themselves of the services of such a factory, if equipped with the most modern machines and testing plant.

The objects of the factory would be mainly:—

(1) To advise regarding the best type of plantation rubber to be used for specific purposes, and best methods of using;

(2) To advise regarding mixings, processes, etc., in respect of which manufacturers may ask for assistance;

(3) Experimental work, with a view to determining new uses for plantation rubber;

(4) To provide the organization for bringing before the trade the results of work done, new methods and uses, etc.

The factory would make reasonable charges for all work undertaken, and should soon be self-supporting.

Management.

We recommend that a board be appointed under the auspices of the Rubber Growers' Association, to attend to the business of the testing station and factory. The work of the board would be to consider all estimates relating to finance, the recommendations of the chief of the technical staff, and, generally, to supervise the policy and appointments of the bureau.

We recommend that the entire work of the testing station and factory be placed with a consulting technologist, who shall be chief and to whom all technical assistants, testing and factory managers, sub-managers, and workmen shall be directly responsible. The board would receive daily or less frequent reports from the chief, and render every assistance possible to him.

Nature of Tests and Certificates.

In the estimates it is anticipated that full certificates on each sample can be prepared in from two to three days, each of eight hours. If necessary, certificates could be available within two days. Where sales are made "subject to certificate," the buyers can, in case of differences, send their certificates to the board for reference to arbitration.

The tests, which were suggested by Dr. Schidrowitz, have been discussed with leading technologists, manufacturers and buyers, who have agreed that they are practically and Scientifically sound. Dr. Schidrowitz and the experts referred to have further agreed that a true value and practical standard of quality can be ascertained by determining vulcanising capacity (rate of cure) and by tests on the vulcanized product determining tensile properties, physical condition and stability. While it is admitted that for different manufacturing purposes rubbers of specific qualities are required, it has further been agreed that general commercial quality can be represented by an index figure covering the three attributes mentioned above, provided that, as is intended, the rate of cure, compared with a certain standard, be also given.

It has been further agreed that if in addition to the index figure of quality the rate of cure is given, the manufacturer will be supplied with all the essential information for the purpose of enabling him to buy the exact grade suited to his purposes. In other words, if he has, for instance, bought for a specific purpose smoked sheet of an index figure say of 970, rate of cure two hours, and found it satisfactory, he will, if he again buys rubber of the same grade, index figure and rate of cure, be practically certain of getting goods which will do exactly the same for him in the factory as the first lot.

The standard basis index figure of quality is taken as 1,000, and this corresponds to a plantation rubber of high quality, showing a high figure under the system of tests adopted. It must be understood that no absolute correlation of the index figure of quality with the commercial value, as shown by the sale price, can be made.

So far as the sellers are concerned, the method will have the great advantage of informing them of the true quality of their goods, and, further, will serve as a basis on which comparative examinations in regard to new methods on the plantation, etc., can be based.

We further suggest that it may be convenient to subdivide all rubbers of various grades on the basis of the index figure of quality. For instance, all rubbers showing an index figure of

900	and	over	being	1st	grade.
800	to	900	,,	2nd	,,
700	,,	800	,,	3rd	,,
600	,,	700	,,	4th	,,
500	,,	600	,,	5th	,,

Manufacturers and technologists who have given evidence before the Committee take the view that it will necessarily take some little time before manufacturers are able to correlate figures in the certificates with works practice, but this having been done, there should then be no further difficulty in regard to buying on such a basis. All tests would be open, at all times, to inspection by buyers and manufacturers, and the Committee believe that the tests employed would soon meet with universal approval.

Sampling.

In the preliminary period, *i.e.*, until buyers understand and have learned to appreciate the value and bearing of the scheme, the sellers will provide samples as they do at present; later, it is anticipated that sales will be effected on certificates only. A number of samples, as in the case of sugar, will not be necessary. In the case of sugar, the tests are readily applicable by both buyer and seller. In the case of rubber this is not so, and one of the main objects of the scheme is to overcome this difficulty.

A sample of 2 lb., to be drawn as may in practice be found advisable, will be sufficient for the testing station for every ten cases of rubber, and on this sample the certificate will be issued. Should the buyer declare bulk not equal to certificate then a sample will be drawn from that bulk by an independent officer (appointed, say, by a Chamber of Commerce, or by a Joint Committee of R. G. A. and manufacturers), and submitted to the testing station under a mark which will not disclose to the station its identity. In the event of the test turning out as in the first case, the buyer shall accept goods and pay a small five per cent. or over, the buyer may either refuse the goods or accept a rebate, as may be thought fit, *i.e.*, the ordinary commercial methods shall apply.

The original sample may be drawn either, as at present, by the wharfingers, or by the latter in the presence of an officer representing the testing

station, and a committee of buyers. The testing station will retain balance of samples.

Cost of Scheme per Pound of Rubber Testing Station and Factory.

Three estimates have been prepared by Dr. Schidrowitz to deal respectively with 10,000 tons, 20,000 tons, and 30,000 tons per annum. These estimates have been placed before manufacturing experts, who regard them as reasonable in cost, and covering as regards material, all that would be necessary. A further independent report may be made on this subject.

The basis of cost is that while every case will be sampled as at the present time, a bulk sample will be made up representing every ten cases, or, roughly, one sample for half a ton.

Testing Station only.

The capital cost for the testing station alone or that combined with the factory is separately given, as are also the annual upkeep charges. It will be obvious that the larger the quantity of rubber tested the lower the costs per pound of rubber will be, the capital charges remaining very much the same. A certain amount of revenue would be derived from the balance of rubber from the samples and in the event of the tests being very large in number, would prove to be quite considerable.

Factory Addition.

The additional capital cost of the factory would, as will be observed in the analysis given below, be approximately £3,000 for whichever tonnage was dealt with.

The annual upkeep charges for the factory would be about £1,500.

If the factory was combined with the testing station the total capital cost in the first year would therefore be £9,300, £12,700, and £16,000, and the combined annual upkeep £9,000, £10,500 and £13,000 for the 10,000 tons, 20,000 tons and 30,000 tons scheme respectively.

The total capital costs and annual upkeep charges in sterling and per pound of rubbber are as follows:—

Expenditure.

Tonage to be tested.	Testing station only.		Combined testing station and factory.	
	Capital.	Annual Upkeep.	Capital.	Annual Upkeep.
	£.	£.	£.	£.
10,000	6,300	7,500	9,300	9,000
20,000	9,700	9,000	12,700	10,500
30,000	13,000	11,500	16,000	13,500

Cost per Pound of Rubber in Pence.

1.—First Year.

(Taking capital cost and upkeep for year together.)

Tonnage to be Testing.	Testing Station.	Testing Station and Factory.
10,000	0·148*d*.	0·196*d*.
20,000	0·100*d*.	0·124*d*.
30,000	0·088*d*.	0·103*d*.

11.—Subsequent Years.

(Annual upkeep, all charges, in pence per pound of rubber).

10,000	0·080*d.*	0·095*d.*
20,000	0·048*d.*	0·056*d.*
30,000	0·041*d.*	0·046*d.*

It should be noted that the waste from samples tested will be considerable, and may amount to several thousand pounds sterling each year, which would go in reduction of working costs.

Each company or owner must instruct his broker to pay all charges due to the standardization bureau, and to deduct these from proceeds of sale.

FINANCE.

From the estimates previously given, it will be seen that the combined capital and upkeep expenditure for dealing with 10,000, 20,000 and 30,000 tons would, in the first year, be respectively £18,300, £23,200 and £29,000. The annual expenditure for testing station and factory combined would be £9,000, £10,500 or £13,000 respectively. This sum is irrespective of any revenue which may be derived from the sale of the waste, raw or partly manufactured rubber, or from any fees which may be charged for the factory work done on behalf of manufacturers.

This Committee recommends that a Limited Liability Company be formed to carry on the work of the testing station and factory, the nominal capital of such company to be £50,000, with a first issue of say, £20,000 in shares of £1 each, to be called up as required.

Every rubber company (including Continental companies) or individual desiring to sell rubber under the testing station certificate shall be a shareholder of the company.

That the minimum number of shares to be held by any rubber company or individual shall, of the first issue, be 100 and the maximum 200; of subsequent issues, as the board of directors may decide.

That each company shall pay such fees per pound of rubber tested as shall be decided by the board of directors from time to time.

That the board shall consist of five members, two of whom shall be nominated by the Rubber Growers' Association. That the remuneration of the directors shall be such sums as may be voted by the shareholders in annual meeting assembled. That power be taken to establish additional testing stations, with or without factories, in such centres as may be thought desirable.

That the maximum dividend payable shall be five per cent. per annum on the capital subscribed, but before any dividend be paid 25 per cent. per annum be written off cost of plant and formation until such costs are eliminated, and that a reserve fund equal to the capital of the Company be accumulated out of profits after five per cent. per annum is paid. Any further profit to be devoted to the reduction of the costs of testing, etc., or for the furtherance of plantation rubber interests.

NOMENCLATURE.

An endeavour may be made on the estate or in the issue of certificates from the testing factory to indicate, by suitable initial nomenclature, the country of origin.

After samples have been taken for the testing station and other purposes, it is suggested that all cases shall be sealed by an official of the testing station, and that after the test has been made the cases shall be marked by the number corresponding with that of the certificate. This would enable the buyers to insist on the delivery of sealed cases if they consider such a course necessary.—*The India-Rubber Journal.*

ANEIMUDI

(The Elephant Head).

ALT. 8,827 FEET.

APOLOGY.

I.

Many poets have come and gone,
Poetesses with them too,
None have cared to sing a song
Inspired by that entrancing view
Of Aneimudi fair—tho' dread
Lifting aloft her Elephant head.

II.

I've waited one and thirty years
For some more worthy of the theme
To put in rhyme their joy—or tears,
And all too hard it now doth seem.
... ...
Before the prime of life is past
I'll have to try it myself at last!

SONG.

I.

Aneimudi Mountain,
Elephantine brow,
With thy tumbling fountain
Flowing Then as Now,
Smoothened by the weather
A hundred million years
Before mankind was conscious
Of aught but trembling fears.

II.

Highest of the High Range!
Pride of place to thee,
Search the rugged ridges
To India's surfy sea;
Only on the Northward
Himalayas snow-clad haze
Beyond all human vision
Checks thy lofty gaze.

III.

Sister Queen, they hail thee!
The giants of the Range,
The peak of Chokanada
Unchanged among the change;
Devimallay's girdle
Once by water worn,
Her sides of verdant jungle
By impious hands all shorn!

IV.

The Mountain of Blackwater,
Kurrankulam rare,
With her crumpled plateau
Bathed in sun-lit air!
Chundavarai's rampart
Fearless facing west,
Greeting the Monsoon wind
Her boisterous annual guest!

V.

Thy flanks so well protected
With upright granite steep,
Thy crown has been selected
Demeanour calm to keep.
Eternal through the Ages,
Gently rounded brow,
Anemudi Mountain,
Claim me Then as Now!

A. Ff. M.
1914.

COFFEE

With the exception of East African and Colombian there is very little offering now that has not been in auction once already. For the export trade there are also some parcels of Mexican, too low for the home trade, and indeed of a grade that does not often come here; but apparently the financial troubles in that country have somewhat benefited the Coffee trade of London by sending here what in ordinary times would go direct to New York. In addition several second-hand parcels of Costa Rica have been offered, but holders do not seem anxious to press sales, and dealers do not care to purchase extra stock only a short time before the new crop is due to arrive. It is satisfactory to see what a large proportion of this year's crop has actually gone into consumption, and specially that the Continent have had to come here for their supplies. The landings have been about 16,000 bags more than last year, but the deliveries have been over 20,000 bags more, so that the stock is between four and five thousand bags less than at this time in 1912. A very large proportion of the remaining stock has doubtless been already sold, and will go into consumption before the new arrives. The tendency of the market has been rather to lower rates, Colombian being about 2*s*. cheaper for the bold size, and 3*s*. to 4*s*. below the highest point for the medium and small sizes. The fall in Santos prices has doubtless brought this about, but why the drop came so suddenly it is difficult to say. The general opinion is that it was due to failures in Brazil, but at the same time the actual selling from Brazil is not by any means heavy. There has been no resolute determination to reduce the large stocks there which are to-day as heavy as they have been for the last two months, and nearly three times as large as at the commencement of the crop. The terminal market, which is always the most sensitive, has been rather erratic, quotations having fallen and risen as much as 2*s*. 6*d*. in a day, and at the close they are cheaper than last week. Such violent fluctuations always affect business, and what is needed more than anything else is a steady market, for prices are quite low enough to make trade remunerative.

LONDON COFFEE RETURNS.

	Home *Consumption.		Export.		Stock.	
	1913 Tons.	1912 Tons.	1913 Tons.	1912 Tons.	1913 Tons.	1912 Tons.
For week ended November 8 ...	273	297	378	399	10,569	10,123
For 45 weeks ended November 8 ...	13,097	14,391	19,387	15,156	—	—

*The Home amount contains a proportion for Export delivered by cart.

OFFICIAL STATISTICS OF THE COFFEE TRADE OF THE UNITED KINGDOM.

		1 month ended Oct. 31,			10 months ended Oct. 31.		
		1911	1912	1913	1911	1912	1913.
Imports	cwts.	41,390	34,150	44,635	673,506	601,701	690,880
Home Consumption	cwts.	24,743	24,198	22,085	223,043	221,579	223,556
Exports	cwts.	48,948	45,930	70,387	617,057	365,103	447,040
Total Deliveries	cwts.	73,691	70,128	92,472	840,100	586,682	670,596
Stock on September 30	cwts.	257,000	217,000	177,000	—	—	—

The Produce Markets' Review.

CORRESPONDENCE.

8th January, 1914.

The Labour Commission.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—"Dyspeptic" does find Mr. Newcome indigestible when he states that the effects of a trust enormously increase rates of pay and lead to a large increase of quarrels and friction. "Dyspeptic" has hitherto been under the impression that a trust, meaning thereby a combination of competitive interests, has precisely the reverse effect. However, this by the way.

Regarding the Commission. Is it not time that the Committee came forward with something more definite than was contained in Mr. Nicoll's letter in your issue No. 44? In the absence of definite proposals, criticism of the general idea is not of much value and what appears to be more necessary are suggestions and proposals regarding ways and means, ways more particularly, as the question of means is one for the Committee to report on.

When we get something definite from the Committee we can start criticising, meantime let us make suggestions. Here is one to start with.

Wherever the Ceylon Commission have a Depôt of office let us open one either next door or across the street. Similarly follow them up with their advertisements, where they stick one let us shove two. The man who reads one will read the other and he will soon know where he is best off. At Home or across the seas. Again in regard to staff. If, as Mr. Abbott points out in the *Madras Mail*, the Ceylon people are making a point of employing relatives of local officials let us do the same. When the Ceylon Commissioner captures the nephew of the Tahsildar let us retaliate by annexing the brother-in-law of his wife or the son of the Stationary Magistrate.

There is plenty of scope for suggestions and I hope you will be favoured with many.

Yours faithfully,
DYSPEPTIC.

P.S.—Anonymity may be a form of moral cowardice but it is also a refuge for the naturally modest.

Dear Sir,—The support to the above scheme appears to have been somewhat half-hearted.

I think a good many planters are hesitating to join because they have not sufficient detail.

Before asking for support I should have liked to have seen the Extraordinary General Meeting of U. P. A. held and then the scheme with full details laid before us and I believe the support would then be more whole-hearted.

If this scheme falls through, I fear we shall be in a bad way as men will not be found easily to devote their time in working out a fresh scheme.

Yours faithfully,
C. J. HAYWARD.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 4.] JANUARY 24, 1914 [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish the Proceedings of the Nilgiri Planters' Association which was held at Ootacamund on the 17th instant. They take up the whole of this week's issue of the *Chronicle* and we make no apology for appropriating it so that every member of every district Association may digest what we consider the most important District Association Meeting that has been held for years. The report has been circulated to all Honorary Secretaries with a request that meetings should he held as soon as possible and the report considered. The Report itself we consider to be almost the most important that has been issued by the U. P. A. S. I. in the annals of its history; and on its adoption will rest the salvation of the Planting Community of South India. The able speeches of the Hon'ble Mr. Barber, Mr. Abbott and Mr. Nicolls amplyfying the Report are most lucid, convincing and unanswerable and the information given that Messrs. Finlay & Co., are prepared to join and hand over their organization together with the experienced Chief of their Labour Department, with certain provisos, to the U. P. A., should have the effect of bringing into the fold and securing the support of the conditional 50,000 acres. The action of Messrs. Finlay & Co. cannot be too highly applauded, meriting the word patrioitism. If their conditions are accepted and supported as they should be the situation is saved and the Labour Question in Southern India will be solved. If rejected the cry of shortage of labour will go on increasing in volume. The solution lies in the hands of the conditional supporters of the scheme. For the common weal they should sink their differences and conditions and leave the working out of the scheme in the hands of the Executive Committee whose labours in the cause have been so unselfish, so devoted and so unenviable. Now is the appointed time. If this scheme is rejected the opportunity may never recur again. Our Rivals in the field of recruiting will not be slow to take advantage of our inability to help ourselves, and labour, that a department of our own will find congenial employment for at the r very doors, will emigrate to the detriment of our Industries. The rejection of this scheme will amount to direct encouragement of over sea recruiting. Let it not be said that with the means at our disposal to work out our own salvation, for the sake of a few exiguous rupees, we reject a scheme fraught with the continued prosperity of our industries and sink into a body of men imbued with nothing but unmeaning verbiage. Let the motto of 1914 be Deeds not Words.

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

A Meeting of the Nilgiri Planters' Association was held at the Collector's Office, at noon on Saturday last, when the following were present :—The Hon'ble Mr. E. F. Barber (in the Chair), Messrs. J. S. Nicolls (Secretary), C. E. Abbot, Robert Stanes, Martin, J. Harding Pascoe, Carson Parker, Gerard Rogers, George Oakes, G.W. Church, S. Bayly, H. Pigott, Willbraham, Murphy, James Stanes, Dandison, Hayne. Grove, Elkington, Cherry, Deane, Norman Grey, Cockburn, Rowson and Aird

Proceedings of last Meeting.

The Proceedings of the last Meeting of the Association were taken as read.

The Labour Commission.

The first item dealt with was with reference to the Labour Commission, and the following Report of the Executive Committee appointed at the Bangalore Meeting was read by the Chairman by the permission of Mr. Mahon, Chairman of the U. P. A S. I.

Executive Committe's Report.

To the Chairman and Councillors of the United Planters' Association of Southern India.

Your Executive Committee was appointed at the U. P. A. S. I. meeting held in August last to carry into effect certain recommendations of the Labour Committee.

Since we were appointed we have seen details of scheme and reasons, which have convinced this meeting of the necessity of the starting of a Commission, which were sent to all agents and planters in Southern India, affiliated to this Association, as per list of *Planters' Chronicle* and we have ascertained as promptly as possible, the support that will be forthcoming.

For reasons we have already explained we were unable to call an extraordinary General Meeting of the Association.

A considerable amount of correspondence has passed and your Committee have had the opportunity of considering many different points of view.

From the replies received we find that 30,119 acres support the Labour Scheme as it was outlined in the Labour Committee's report and that 51,673 acres recognize the necessity of a labour department.

This latter acreage has been put down as conditional, in some cases the conditions implied are the sanction of proprietors and directors at Home and the question of supporting the scheme is still a matter of correspondence. Your Committee might have waited for some decision one way or another in these cases, but we felt that as the majority of the conditional acreage imposed conditions that were not on the lines of the Labour Committee's suggestion and as the matter has already been hanging on for five months that it would be better to refer the whole question to the members of the various Associations again.

In coming to this decision we are influenced by the recent increased activity which is being shown in other countries to secure labour in Southern India.

Leaving aside the conditional acreage already referred to, we find that the conditions imposed by the remaining acreages are so varied and in some cases so incompatible with each other and the original scheme, that we are unable to reconcile them.

It is impossible in the short length of this report to give in full the varying details of the conditions, nor does it appear necessary to do so, for we think that they have been freely discussed.

We might however mention three :—

(1) Preferential subscriptions for certain products.

(2) A reduced subscription and a smaller start.

(3) A strong start backed by sufficient money and acreage to enable the Labour Department to meet its rivals on level or even better terms.

With regard to the first of these your Committee have given the matter careful consideration and we have found it impossible, for the present at any rate, to make any recommendation that will suit the views of all and at the same time meet the financial requirements of the scheme. We must also add that in going carefully into the reasons which it is alleged make some preference necessary we do not find that they are strong or even logical. In fact the case in favour of a preference is often overstated.

For the beginning, at any rate, your Committee think that tea, coffee and rubber should stand on the same footing and the only further recommendation they can make is that pepper and cardamoms be put on half rates and that Cinchona be excluded.

With regard to the smaller start and the reduced subscription, your Committee agree with and adopt the remark made by one of its members, Mr. Nicolls, at the Bangalore Meeting, when he said that if there were men present who thought that they could start the scheme on a small scale, they were mistaken. That day had passed. They had now to tackle the matter on a scale that would enable them to compete with Ceylon and the outside competition. If they were going to start on a small dribbling way, they might as well chuck it out altogether. The time had come to start whole-heartedly and to go into the thing with a splash that would frighten the others and let them know that they were not going to lag behind any longer, but were going to show their worth.

We are convinced that a scheme started on a small scale will remain on a small scale during the short period of its useless existence. That the money spent on such a scheme will be money wasted except for the negative advantage that we shall have learnt not to try such a scheme again. A Labour Agency started in one recruiting area, poorly backed by acreage and funds will have no chance of doing good in the face of the stronger and better organized competition it will meet or if a start were made in several districts at once, as is suggested by several supporters of the proposal, and is indeed a condition of their support, the end would only come more rapidly.

Your Committee now come to the conditions imposed by those who want a strong start made. We find that they form the larger part of the conditional acreage and we also find that opinions held do not differ in any great degree from the opinions expressed at Bangalore, on which the original scheme was based and we think that those who have promised definite support to this scheme will have but little difficulty in agreeing with

their conditions and combining with them. If this is so we find some 50,000 to 60,000 acres are in favour of a strong scheme started on a broad basis, which will give an organization to help planters in their recruiting through the length and breadth of the recruiting districts. The supporters of this suggestion have given your Committee an advantage which they have not had elsewhere, they have given us a scheme prepared in full detail by practical men, who know the work, what can be achieved and how it can best be done. Your Committee believe that a proposal of this kind, with such backing and with a solid basis of success to start with will appeal to other firms who have hitherto withheld their support from a scheme which they may have thought was being put forward by men who had not sufficient experience of the difficulties of such an enterprise.

Your Committee therefore recommend that the U. P. A. S. I. Labour Department should be started on strong lines only, such as will ensure stability, efficiency and continuity and to attain these they find that it is necessary to have a backing of 1,000,000 acres. to have a subscription of Rs. 2 per acre and to have this subscription guaranteed for at least 5 years by the supporting acreage.

We have pleasure in submitting this recommendation for your consideration, adding, that in our opinion, the matter is one of urgency and and should be referred to District Associations for their consideration with as little delay as posssible.

(Signed) C. E. ABBOTT,
,, J. S. NICOLLS,
,, E. F. BARBER.

Mr. Deane, on being informed that tea, coffee and rubber, were to stand on the same footing, remarked that he was certainly in favour of the Labour Commission and as far as he was aware they were willing to unite, but he did not think it fair to assess coffee the same as tea. He thought it not possible for all the Planters of the Nilgiri Distrct to support the Labour Commission, if coffee was to be assessed the same as tea.

The Hon'ble Mr. E. F. Barber then addressed the meeting as follows:—

LABOUR.

Gentlemen,—The Executive Committee of the United Planters' Association of Southern India which was appointed to deal with the Labour question at the last August meeting has been working for five months.

The scheme for a Labour Department which was passed unanimously has now been considered thoroughly by the whole community.

It will have been obvious to any one who has glanced at the *Planters' Chronicles* how divergent are the views of individuals. They vary from the opinion that no Labour Agency in necessary through various shades up to the opinion that a Labour Department should be run on the lines laid down by the United Planter's Association of Southern India. I am glad to say that those who think nothing should be done form a minority but on the other hand it is to be regretted that those who have offered whole hearted support to the Labour Scheme are not, in the opinion of the Committee strong enough to make a start by themselves. The opinions of those that are in favour of a scheme of some sort also vary considerably, there are those who urge caution and advise starting on a small scale while there are others who say that the United Planters' Association Scheme does not go far enough

and that the estimates as drawn up by the United Planters' Association Committee are insufficient to meet the cost of a Labour Department. There is much to be said in favour of those who urge the cautious line. They say that this is entirely a new business and that it would be far better to build slowly and build well. That a strong nucleus might be started in the most difficult recruting centre and gradually extended. The objection to this is that a localised start will be more expensive to the acreage of planting to be served and square miles of recruiting country to be covered, than a general start and I am afraid, judging by the correspondence that has been received, that it will be found impossible to get general subscriptions for a purely localized start.

Those in favour of going the whole hog form a stronger and more compact body. They can say and can prove that the nucleus organization has been started, that it exists and that as it is run at present it is giving satisfaction. It can be taken as a fact that those in favour of a small start are speaking from theory while those who want the whole question put on a broad basis from the beginning are speaking with the experience of some 10 years of practice behind them.

Messrs James Finlay and Company Ltd. have got an Agency of their own and in working this Agency up to its present state of efficiency they have spent time, trouble and money. It is only through expensive mistakes during the first five years that their Labour Department has reached its present satisfactory position. Since then they have got on to the right lines and during the last three years the estates have been reaping the benefit of their previous seven years' expenditure.

Now the experience so gained must be a valuable asset to any Estate or Company that has acquired it.

Experience which has not only shown the right methods of dealing with so difficult a problem in a more or less local way, but which has also indicated the way in which the problem can be dealt with on a larger scale is not easily come by and once gained is not to be parted with lightly.

When the Committee started on its labours on the lines laid down by the United Planters' Association it was natural that the first step they should take was to approach Messrs. James Finlay & Company's representatives. They approached them not on on the lines of being absorbed into their Company's organization nor did they approach them with a view to getting the Company to give up its existing organization in order that they might join the somewhat undefined scheme drawn up at the Bangalore Meeting. The whole *raison d'être* of a Labour Scheme is to eliminate, to what extent it is possible, ill regulated and unfair competition and to minimize the evils resulting from such competition. The Committee therefore asked Messrs. James Finlay & Company to lend them the services of Mr. Aylmer Ff. Martin so that the proposed United Planters' Association's department might be run on the same lines as the Company's department, and so that the two departments might work side by side with no friction and to their mutual advantage.

The Committee felt that they were justified in offering the Company the right to join the combined department if they wished to do so after it had proved itself and also the right of withdrawing Mr. Martin's services if the Association's department failed to get adequate support.

From the beginning the Committee have met with sympathy from the Company but it is only during the last week that they have learned exactly to what extent Messrs. James Finlay & Company are prepared to help the combination.

They are prepared to come in at once, on even terms with others and to put the whole of their machinery, including the valuable mainspring itself, at the disposal of the Association, provided that they are satisfied that the organization will be strong enough in numbers and money to carry out its work properly.

The actual terms in detail I have here, but the three most important one's are :—

1. The backing of 100,000 acres of which they will supply nearly one quarter.

2. A guarantee of Rs.2 per acre per annum for 5 year, which is a fair period required for the thorough and efficient establishment of the business and to achieve material results, and

3. The understanding that the question of the restriction of advances be an integral and vital principle of the scheme.

The backing and the money required will no doubt come as a surprise to a good many, but the Committee have had the opportunity of scrutinizing the estimates and have no hesitation in saying that the expenditure is necessary to ensure the success of the scheme, of which I can give some broad outlines.

I have got a map here which Mr. Martin has most kindly prepared. You will see that the recruiting areas tapped and untapped extend all over Southern India.

The total area of the controlled is some 100,000 square miles and it is proposed to divide this into 10 circles, each circle having its European. Every district is provided for but the strength of the combination must be at those points where outside competition is keenest and where in consequence, piracy is most rampant, These are in Salem and Coimbatore.

The headquarters of the Department are to be at Bangalore. This point may not be geographically so central as Coimbatore, but with the headquarters of the Association at Bangalore certain advantages are obvious and it is within a night's journey of the much harassed districts of Salem and Coimbatore. It is also closer to circles 1 and 2, Anantapur and Cuddappah which must receive close attention if the situation is to be relieved. Coimbatore is to be the headquarters of the Deputy Director who will have an Assistant immediately under him at Salem. The men for these posts must be carefully chosen. Nos. 5, 8 and 9 (the Chinglepet, Trichy and Madura, Tinnavelly circles) may be looked on as frontier provinces. The white piece of sea board is practically reserved to Ceylon and Straits and we have no wish to interfere with it, but it is obvious that if our reserves are interfered with in other parts that it is here retaliation, which I sincerely hope will not be neeessary, can be most easily effected. I need only refer to No. 3, South Canara; there is a good class of labour here which has in the past and should in the future serve the Northern Districts. This circle must protect these districts from depredations from the South and it is very necessary that they should be protected. There has been a considerable drain on these South Canara coolies during the last two years and the immediate cause of this drain has been the severe competition towards the South and East.

Well, we have 10 circles to be served. Naturally the headquarters' circle will have the heaviest expenditure, it will have the direct control of the Agencies in that circle as also the control of the other circles. The

estimated expenditure at headquarters amounts to the sum of Rs.50,000 per annum. This leaves Rs.1,50,000 to be divided among the remaining 9 circles say an average of Rs.16,000 a piece.

Now from the experience gained it is certain that not one of those circles could be worked independently for less than Rs. 50,000. If Coimbatore and Salem were combined as one circle as is proposed and worked alone, the cost would be over Rs. 60,000 and the efficiency of the circle, so worked would be impaired.

I think myself that the localized start that has been suggested is impracticable for the reasons that sufficient money is not likely to be forthcoming, and that such a start will prove but partially effective.

While on the matter of cost it would be as well to touch on the variation of subscriptions. It has been suggested that the coffee planter since he employs less labour and since his returns are smaller, should pay a smaller contribution for salvation than his brothers in tea and rubber. It is equally true then that he can less afford to pay increased rates of pay and large advances than the rubber or tea man and therefore his need for salvation is greater.

It is also a fact that lower rates have been paid in coffee districts hitherto and in consequence their recruiting grounds have been attacked and will be attacked again and again until rates and advances have evened up, in other words they are in need of a Labour Department for defensive purposes. A 2 rupee contribution may seem high now, it may, and I think it will, prove itself to be money well spent in a few years time. As to the comparison of the number of coolies used, well tea, is or would like to be, the more constant employer, but it is not the average number employed that has to be considered but the maximum number employed at any time during the year. But this is rather beside the point, for it does not matter as long as the acreage and income behind the department is sufficient. If the 50,000 acres of tea and rubber came in at 2 rupees and 1,00,000 acres of coffee at 1 rupee it would be more satisfactory from a business point of view than an income of Rs.2,00,000 from 1,00,000 acres.

There is one criticism that is bound to occur to every one. How is it possible if the Ceylon Labour Commission has been working on Rs.1,60,000, the South India Department will be able to spend Rs.200,000. The answer that will occur to any one is that Ceylon has advantages that we have not got: from South India to her estates there is only one inlet, while we have dozens.

This is not the only answer though, Ceylon is preparing to subscribe up to 2¼ lakhs, but even so I think that with our 2 lakhs we shall have something better worth having than they have got. I have had letters saying that our Labour Department must be run on lines similar to the Ceylon Commission and I did think at one time that, without too slavish imitation, this must be the case, I am now pretty certain that this is not so, our Labour Department must do many things that the Ceylon Commission does not do, and I am glad to think that there are some things, which the Ceylon Commission does do, which can be left undone with advantage. The fact of the matter is that while many of us have been thinking over this matter as amateurs, a few of us have been working at the matter as professionals. These men have gone into the smallest details as carefully as they would the details of any other business proposition, they have been able to test these details in practice and as a result they are able to take a comprehensive view of the situation that the majority of us cannot do.

I now give you an outline of what a Labour Department will do.

1. Assist in regulating competition (internal.)

2. Carry on an active propaganda against unfair competition, internal or external.

3. Give accurate information about property, status, character and operations of Kanganies and Maistries.

4. Recover a proportion of debts in cash and persuade defaulters to return to their Estates.

5. Hurry up laggards.

6. Assist maistries and Kanganies in all their difficulties.

7. Give active assistance in recruiting coolies, but without employing direct recruiting methods, by supplying information as to the best centres for getting coolies and best time of year for recruiting there.

8. Help in service of warrants, civil or criminal.

9. Prosecute an active search for new connections in entirely new districts.

10. Advertising.

11. Visit and advise Estate Managers, if desired, in their endeavours to improve their labour forces as to the best methods and districts for their particular Estates.

12. To use active measures for the suppression of professional recruiters.

We now come to the question of the restriction of advances which Messrs. James Finlay & Company ask may be made an integral part of the Labour Scheme. The suggestion was made at Bangalore but received only a cursory consideration, for it was thought to be impracticable; and so it was, and will remain, until there is an organization strong enough to put this valuable precept into practice. Now restriction of advances does not mean that a dead level of advances must be insisted on. Planting districts and recruiting districts vary. For instance with the department keeping careful watch over the interest of the employers, advances should rule far lower in South Canara than they do in the districts where the competition is keener. The limitation of advances will be controlled in the recruiting districts by the department. Any one not using the department will have the very doubtful advantage of being able to give higher advances, but if the department is doing its duty in other respects they will not hold the advantage long. Surely every one can see that value must come if this advance system can be limited. It is fast becoming a heavy but indefinite item of expenditure and cost of production, which every business man must view with grave concern.

Now the value of what a Labour Department may prove to be is often judged by what it might do in the way of recovering lost advances. Only two days ago I saw a letter in which the writer said that his one year's subscription to the Labour Department would cost more than he has lost in advances during the last 16 years, meaning to argue, I suppose, that it was not worth while having a Labour Department. I say this is quite a wrong way to look at it, for as the system is now, advances are always out, the money so advanced gives no returns and any increase in advances may be regarded as increased expenditure. I should very much like

to know how advances have increased per head during the last 16 years. That would be a better test than the lost advances only. There is a shortage of labour, I know this from extended personal experience, I know estates that have lost thousands of rupees because they have not been able to weed, pluck and tap and I can gather that the shortage is general for otherwise I do not see that the delegates at the last meeting could have been so unanimous and decided that a department was necessary. I think the value of the department should be judged by the lost crop and work left undone as well as by the lost and increased advances.

I do not say that because a Labour Department is started that the immediate effect will be that every estate that joins it will have sufficient coolies. That would be too much to expect, but we shall have an organization working to that end and I feel sure that if it is run on the lines suggested by Messrs. James Finlay and Company and controlled by our friend Mr. Martin, who has been working at the matter for the last 10 years, it will go near to achieve its object.

The alternative is not to have a Labour Department, to carry on with our old methods, privateering and pirating and cutting our own throats. I do not know what the result will be in five year's time, but there are a few facts that we do know. It is stated that more than 1,00,000 acres of rubber in the Straits will be coming into bearing in 1914—15, that two estate Agency firms in the Straits have combined to start a recruiting Agency in South India, that two large rubber Companies are doing the same thing, and we know that Ceylon intends increasing her labour cess to nearly 2½ lakhs with the object, to use the Commissioner's own words of 'putting a net over the whole of Southern India.'

Where do we come in ?

Mr. Cockburn, said that some thought the scheme would benefit the big planter at the expense of the small one. He said that the Eastern Nilgiris possessed, at one time, numerous coffee estates, but the planters there had now taken up tea. He did not think Mysore was so much a tea district, but the Eastern Nilgiris was not a good coffee district. The falling off was due to the difference in rainfall and several other causes. He thought that they should support the scheme in view of the future.

He added that planters now had a chance which they should seize before it was too late.

Mr. Pascoe remarked that all the estates in the Kannan Devans were well supplied with labour, for Mr. Martin had been going everywhere. He thought it was a good organization and was in favour of strengthening it. There would be no more shortage of labour in future, and though the guarantee of Rs. 2 per acre seemed at first a big sum, he was personally convinced that there would be no more setting up of machinery. Mr. Robert Stanes, as representing the Nilgiri Plantation Company, remarked that they could not agree with the proposed Labour Commission and the levying of Rs. 2 per acre for the first year. He thought that the Labour Commission would also do the recruiting of labour and he did not see what advantages would accrue if they did not help them in the recruitment of labour. He thought the Nilgiris were somewhat different to other districts. They had Native States to deal with, where they could not get any extradition, and it would be difficult in many cases for the Labour Commission to get help in absconding maistries and coolies. He would be

glad to know what exactly would be the benefit by joining the organization. The Nilgiri Plantation Company had an acreage of 3,000 acres which would mean, according to the new scheme, a sum of Rs.6,000 for the first year. Their advances also ran heavy. He was of opinion that it would be better if the Nilgiri Association had its own little Labour Commission, simply for the surrounding districts like Coimbatore, for it would be better than belonging to a large scheme where they might sometimes find themselves lost.

Mr. Martin prefaced his remarks by saying that he was pleased to meet several of his old friends and also in making new ones. They had all heard the report of the Executive Committee appointed to go into the Labour Commission question. He preferred the term "Department" to the term "Commission," chiefly because the latter word should never be used in connection with recruiting of coolies. It savoured too much of the professional recruiter. They had heard that one of the things which the new scheme would do was to give active assistance in recruiting. It also included putting them on a new Labour footing. If they wanted help they could supply themselves with it and help on their maistries who might be recruiting to get coolies for the advances they had given them. If they were short of labour, they could get it in many ways by the proposed department. In the districts of Bellary, Anantapur, Cuddapah, Kurnool and Nellore there was practically nothing to do except to get new labour. One small area there was already tapped by the Babubudins and this of course would be reserved for them.

One of the reasons for the Rs. 2 per acre was that their estates would constantly be in control by the best Europeans they could get and the work would be constantly checked.

Mr. James Stanes.

Mr. James Stanes asked if estates that were not paying and acreages that were not in bearing were expected to contribute? For, if so, he thought that many would stay out altogether. The Chairman replied that the scheme was not put forward with a view to increasing losses and diminishing dividends, rather the reverse. With the cost of bringing tea into bearing, estimated at something between £20 and £40 per acre, he could not see that the addition of an extra Rs.10 per acre would affect the propositions very much.

Mr. C. E. Abbott spoke as follows:—

"Gentlemen, I hardly know why I should be asked to say anything at this meeting. I certainly was appointed one of the Committee which had to work up this Labour Commission, but in my capacity of Secretary to another Planters' Association I fear I can only figure as the dreadful example of a man who has failed to convince the bulk of his constituents of the advantages to be gained by joining the scheme. However, there is this to be said in excuse for Wynaad, that nearly every manager of an estate there is a warm supporter of the Commission. But when you have the opinion of men in charge of 8,000 acres out of 11,000 overruled by that of one gentleman in London, who merely remarked that good men always preferred to do their own labour recruiting, it makes things rather hopeless. I can only say that the men I know in Wynaad are as good as any others and are of quite a contrary opinion, and that very few of us have made much of a success of our recruiting in 1913. Also that the Ceylon Planters, who are often held up to us as examples of what Planters should be, are enthusiastic supporters of their own Com-

mission. The Kannan Devans are one of the few districts that have had all the imported labourers they required. Planters there are unanimous in their approval of their own Labour Department and of its Manager. Here on the Nilgiris, where you have been hitheto less dependent on outside recruiting than in many other districts, many of you were at first, I know, disinclined to come into the scheme. But you are fortunate in the possession of an Honorary Secretary who has thrown himself into the work, and you are now among the most liberal supporters of the Bangalore proposals. It was quite a simple matter 20 years ago for a Planter to get all the coolies he wanted, and if he did not, you might say it was his own fault. Matters are very different nowadays. The new acreage that has been opened in India and Ceylon and the Straits has brought numerous recruiting agencies into existence. The Canarese cooly on whom you and Wynaad depended, is no longer available in anything like adequate numbers; coolies in Coimbatore and Salem, whom we could always get in crowds for six months in the year, have, speaking for Wynaad anyway, totally failed us. Any coolies that do come from those districts usually turn out to be advanced by about three different agencies.

The organization of a labour force, like every other business in these days of specialization, requires specialists to manage it. Most of us recognise that it is high time new Districts were opened for recruiting and that the Planter who has plenty of work to do on the estate, cannot possibly undertake the task. You have all read in the *Chronicle* how thoroughly this fact has been recognised by Ceylon, and the expensive operations that the Ceylon Commission is contemplating and not only in Ceylon, but in the Straits are re-doubled efforts being made to meet the great demand for more labour that the enormous acreage that is coming into bearing next year will involve. Are we in India to go on the old lines just hoping for better luck and doing nothing to help ourselves? We have got a chance, and if we do not seize it, it will probably be the last we shall have."

Mr. Nicolls, the Secretary, thanked the members of the Association for heartily supporting the scheme by their subscription. He already had 3,000 acres, and a contingent support of 10,000 acres, while the subscribing acreage to the N. P. A. was only 12,000 acres. As regards advances to maistries, he thought the total money advanced to them would never be refunded in full and would be carried on over and over again.

If a maistry was advanced for 100 coolies and brought in only 10 coolies he thought that if the total advances were kept on the books as good advances it was wrong. Of an advance so made only 10 per cent. was good and the rest was bad. He could not understand the arguments of members when they said that coffee acreage could not bear the cess. Did this mean that their coffee was moribund. Speaking for tea he said he would not object to a rise of 25 per cent. in wages provided such a rise meant that he would get what coolies he wanted. He would cultivate and manure and increased yields would more than repay him. How would such a rise affect the coffee planter? If he could not afford to pay Rs. 10 spread over 5 years, he surely could not afford to face a rise in wages and advances. A labour department would do all in its power to keep rates down by eliminating the competition that tended to force them up.

Mr. Cockburn had said there was an idea that the new department would benefit only the big man. He thought it a great pity that this idea had caught on. He thought the new department would be of a high standard and would increase by 25 per cent. There was a supply of labour lying idle that would meet the demand.

Mr. Martin said he was very anxious to scrap money from Mr. Stones and the Nilgiri Plantation Company. He did not want to lose 5,000 acres. He had heard Mr. James Stanes mention the word tax. He personally liked the word insurance and pointed out that if the 20,000 acres he had the honour to serve considered the new scheme unprofitable, they would not go on putting money into it.

Mr. Elkington asked if other employers of labour would join the scheme and the Chairman said that this might be considered when the scheme was started.

The subject was postponed for further consideration.

Weights and Measures.

The Chairman stated that the Honorary Secretary had sent out circulars in this connection and a suggestion was made that Mr. Hughes should be appointed their representative.

Mr. Martin had taken the trouble in 1905 to collect different weights and measures throughout the whole of Southern India and that information was at the disposal of their representative. He did not think it necessary to propose that the Secretary's action in the matter be approved.

Warrants.

Mr. Gerard Rogers stated he made a complaint against one of his coolies. A constable was ordered to serve a warrant against him but the cooly made a present of Rs. 5 and sent the constable away. A second constable approached the cooly with a warrant, and the cooly presented him with Rs. 2 and sent him away. The cooly mentioned these facts to him (Mr. Rogers.) He reported the matter to the District Superintendent of Police who sent down an Inspector of Police. He had never heard any thing more in the matter.

The matter was recorded.

Mr. Rogers also stated that a cooly recruiter by name of Cumming was reported to have been preaching in the shandy and inducing coolies to go to Ceylon.

With a vote of thanks to the Collector for the use of the room and a vote of thanks to the Chairman, the meeting terminated.

In the Journal of the Royal Agricultural Society of England, Vol. LXXIII, pp. 1-9, appears an article on the value of soil analyses to the farmer, by A. D. Hall, F. R. S. In the summary to this account the writer puts forward the following benefits which accrue from analyses: (1) mechanical analysis enables us to classify soils and assign an unknown example to its type; (2) from the type, combined with knowledge of the situation and climate, we may predict its suitability or otherwise for particular crops; (3) chemical analysis will tell us whether a soil is getting acid or needs liming to make it work properly and utilise the manure supplied to it; (4) from chemical analysis we can settle what class of manures ought to be used—whether sulphate of ammonia or nitrate of soda, superphosphate or basic slag; (5) chemical analysis will often reveal particular deficiencies and the specific need for phosphates or potash, but to do this with any certainty, the composition and behaviour of soils of that type should be known from a previous soil survey.—*The Agricultural News.*

CORRESPONDENCE.

Cowcoody,
Somwarpet, N. Coorg,
Jan. 15, 1914.

The Labour Commission.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—Kindly allow me one more word on the Labour Commission, as Mr. Abbott's letter requires some reply. All honour to the men who have worked so hard for what they think will benefit their districts. The point is that other districts and other men think differently. For instance, for Mr. Abbott's remark in the *Madras Mail* this district could read "1913 is the best year for labour ever known" &c. The small owner is in the case of the farmer at home. He is doing nicely thank you and only wants to be let alone. He does not want legislation or nostrums intended for his benefit, above all with prices of everything rising except those of his own product, he does not want further raids on his pocket or hen roosts. What I meant was that the *effect* of the Commission, if any, would be to draw away labour to the big companies. The effect would be to standardize money wages, not real wages, and this standard would, of course, be the highest paid anywhere in S. India. (In real wages 5 as. may more than equal 8 as. or more in another district). Those who have hitherto had to pay the highest will then find themselves in the same position as before and will have to raise again. So the vicious circle will continue until all but the richest companies or most paying products will have to close down. It may be said, this will happen in any case. Perhaps so, but the Commission would hasten it and why pay to help to bring it about? Other parts of Mr, Abbott's letter confirm my view viz. the immense and increasing cost, the wise efforts to improve conditions and communications in Ceylon and the virtual slavery a trust can bring about *i.e.*, in the Straits.

Yours faithfully,
N. NEWCOME.

Sholarock Estate,
Katary P. O., Nilgiris,
16th January, 1914.

Tea Yields.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—As a matter of general interest where so many hundreds of acres of land have and are being planted with tea during the past 3 years in this district I presume yields off *young* tea, if discussed in the columns of *P. C.* would not only be interesting, but instructive.

During October—November 1910, I planted a 50 acre block with *5 month old plants* (as seed for this clearing was only obtained in May of that year) 13 acres of the 50 being planted at stake with germed seed *in June of the same year.*

It was a good planting season and the whole clearing came on *well*, in spite of entirely bed plants.

The clearing is planted 4½ x 4½ feet, and dadaps (seed at stake) were planted 25 ft. x 25 ft. at the same time as the tea. The growth of the tea

has been particularly vigorous. I started tipping in September 1912 and give below the yields since that month: –

1912	September	489 lbs,
„	October	1,645 „
„	November	563 „
„	December	1,589 „
1913	January	1,592 „
„	February	809 „
„	March	1,766 „
„	May	2,262 „
„	June	1,727 „
„	July	2,383 „
„	August	3,490 „
„	September	3,390 „
„	October	4,010 „
„	November	3,998 „
„	December	2,854 „
	Total ...	32,567 „

This represents 162 lbs. *made tea per acre*, when the clearing was 3 years and 1 month old from planting.

I do not of course claim this as a record, but considering the average rainfall is 60 inches per annum only and elevation about 5,000 ft. above sea level, are these figures good?

I have been most careful not to over pluck, this is proved by the spread of the bushes which on an average are 4 feet in diameter, some measuring over 5 feet across.

Yours faithfully,

PHIL. BEAVER.

[It would be interesting to know the price realised for this Tea per lb.—ED.]

Ootacamund, 19th January 1914.

Cinchona Bark.

THE EDITOR,

The Planters' Chronicle,

Bangalore.

Dear Sir,—In view of negotiations with Government regarding the growing of Cinchona, I had occasion to find out if it was still possible to sell cinchona bark in London.

In response to a cable at the end of November, I found out that it would be possible to sell 5,00,000 lbs. of bark annually for 5 years at about ld. per unit.

My correspondents have now written: –

"Since the cables passed between us the Dutch Manufacturers have again raised their price and free Cinchona has of course advanced in consequence."

This may be of interest to those who have bark to dispose of, for I understand that Government are now buying from planters at 5 cents per ½ kilo which is equivalent to about nine tenths of a penny per unit.

Yours faithfully,

E. F. BARBER.

The Planters' Chronicle.

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(INCORPORATED.)

Contents.

We publish an article from the Scientific Department which deals with several matters interesting to the planters. The para. on sampling of Fertilisers should be carefully noted for future guidance.

It will be noted that the Planting Expert has left on tour and will not return until 12th proximo.

The Proceedings of the Bababudin Planters' Association are printed, and we are indebted to the courtesy of the Honorary Secretary for the report on the Subsoiling Demonstration which was given by Mr. McQueen, Messrs. Nobel's Agent, before the members of that Association.

Our correspondence columns are largely availed of this week, and in the light of the Meeting of the Nilgiri Planters' Association, printed last week, are unusually interesting.

"Manager" criticises Mr. Newcome's letter with good temper and courtesy, though he does not agree with him. To those who doubt the value of the Labour Commission we specially commend the last sentence of this letter.

"A. C. C." puts a question which those who oppose the Establishment of a Labour Commission should endeavour to answer. There must be many whose experiences tally with those of A. C. C.

We publish with pleasure a letter from Mr. Scoble Nicholson, Ceylon Labour Commissioner, in which he refutes a statement made by Mr. Newcome, on what Mr. Nicholson calls "hearsay evidence." We are convinced from past experience that any such instances enumerated by Mr. Newcome will always be courteously attended to by the Ceylon Labour Commissioner and when possible rectified.

We welcome Mr. Oliver's letter, as evidence that the Report of the Executive Committee and the speeches of Messrs. Barber, Abbott, and Nicolls, had only to be read carefully to make many converts. Mr. Cockburn's letter emphasises what Mr. Barber said in his lucid speech.

Mr. Hughes sends a letter which we have much pleasure in printing and in a foot-note to it have regretted the error, and corroborate what was said by him at the Annual Meeting.

THE SCIENTIFIC DEPARTMENT. U. P. A. S. I.

The Yellow Bark Louse of Tea.—Specimens of this disease having been sent in recently, the following description of this scale insect may be of interest to Tea planters. The scale is known to Science as *Aspidiotus camelliae* and was first discovered by Green on tea in Ceylon. It is more particularly a pest of young tea up to its second or third year of growth. The scales are often found massed upon the young stems, and in the axils of the leaves, and they kill the upper part of the plant. Fresh shoots spring from the lower eyes, but these rapidly become infected and are killed, when more shoots are put out, and so on till the plant dies. The scale is of a yellow colour with a reddish brown central mark. The scales when attacking tea are hairy, but the hairs really belong to the tea leaf; on a smooth leaf the scale is smooth also. The adult male scale is unknown. The young larvae are bright yellow and active. This scale is known in all parts of the world, and in India attacks Tea, Cinchona, Acacia, and Osbeckia among other plants.

In the case of young plants wholesale removal and destruction by fire seems to be the only practical treatment. With more advanced plants collar pruning might be adopted. Once the plant is attacked by the scale it becomes a source of danger to the neighbouring plants. All prunings from scale infected plants, and all plants which have been killed by the scale, should be burned *on the spot*. If they are removed to other parts of the field the pest will almost certainly be distributed along the line of transport.

In their book on the *Pests and Blights of the Tea Plant*, Watt and Mann quote Green as saying, "badly infected plants seldom recover their vitality, the stems become thin and wiry, and seem very reluctant to throw out fresh shoots. There is nothing to be done but to take out the plant and supply another in its place. The diseased plant should on no account be allowed to remain beside the new one, or this latter also will speedily become infected." The authors continue, "So far as we have been able to judge, firing bushes, or plots of tea, affected by this pest is fairly successful. The plants receive a severe shock, no doubt, and those that were nearly dead in any case die outright, but a large percentage of the bushes are saved which, as Green very properly remarks, would certainly be killed, when once this pest becomes fairly established."

Vigorously growing plants should be used for supplies and probably basket plants will be the best as they receive the least shock by being removed: and it would seem probable that something might be done by spraying, especially if used as a preventative method by treating the supplies before the scale has managed to establish itself upon them.

Mosquito Blight.—This disease still does a lot of damage, especially in Travancore. I have no new methods of control to suggest, but I would call attention to the methods adopted with success on Mount Estate in Peermade where the Blight was very bad three years ago. An account of the methods used to check the pest on this estate were given in the *Planters' Chronicle*, Vol. VIII, p. 206 and may be summarised thus:—

1. Put small children on to catch the mosquito and collect the eggs.
2. Prune the Tea in the Monsoon, or dry weather, but not in showery weather.
3. Bury all prunings with Basic Slag at the rate of about 300 lbs. per acre. Holes one to every four trees in alternate lines.

4. Have all ravines cleared, and cut out all Cinchona and all the Etha Jungle.
5. If the boundary of the Tea is jungle, fell the same one chain back and plant up fuel trees, but not Gums.
6. Care must be taken when pruning that mosquitos do not fly into the next field. On the windward side burn leaves and some prunings so as to make a heavy smoke.
7. Moss and clean the bushes after pruning.
8. If mósquito returns after pruning spray immediately with tobacco juice.
9. Cultivate as much as possible with bulk and Dadap manuring.

The fourth recommendation is very important as both Cinchona and Etha are food plants of the mosquito. It often happened that there is a great deal of Etha on the boundaries of Tea estates and though it may not be possible to get rid of all of this it should be kept as far from the Tea as possible.

The prunings are usually burned, and when this practice is adopted they should be burned as green as possible, if the same day as they are taken off so much the better, and a *clean* burn should be made. All the prunings should be carefully gathered up and after the burning is completed, the paths should be swept and the tea forked and all the leaves and small litter left completely burned. Such rubbish usually contains either the living mosquito or its eggs. At the same time mossing and cleaning of the stems should be done.

The reason for this is that, as Antram discovered, the eggs of the mosquito in prunings lying on the ground produce young insects which can feed on the prunings so long as they remain fresh and they will afterwards leave them to crawl up the pruned bushes. Prunings remain fairly fresh and green for a long time when lying in drains and on the shady side of the bushes.

In the case of the Mount Estate the methods enumerated above met with so much success that the pest was almost eliminated, so that they have been proved practical.

The Mosquito often attacks the young shoots of the pruned Tea as soon as it starts to grow and kills them back time after time. This is especially the case when the climatic conditions are not favourable to rapid growth. It is possible that a light dressing, one to one-and-a-half cwts per acre, of Nitrolim worked into the top soil at the time of pruning might produce such rapid growth as to allow the shoots to get away from the Mosquito and this might be tried experimentally on small areas. Nitrolim costs about Rs. 200 per ton and should be got up to the estate in iron drums, or sealed kerosine tins. It is so finely divided that during a long transport it sifts through even double bags and a good deal may be lost in this way.

Dadaps:—During my recent tour I was gratified to find that the value of Dadaps as a green manure is being appreciated on Tea estates. They should be constantly lopped and the loppings either used as a mulch or dug in. When the Dadap trees begin to get big their roots on one side should be cut off close to the base of the stem and left to rot. The surrounding Tea will benefit both by the cessation of the withdrawal of moisture and plant food by the Dadap and also by the high nitrogen content of the root and the rotting nodules. The following year the roots on the opposite side should be cut. After this, when despite the cutting of the roots the Dadap

trees have grown too big and are beginning to damage the Tea, young cuttings should be planted between them and when these are nicely established the old trees should be removed and burned.

It has been rumoured that Dadaps in fields attacked by Mosquito Blight foster this pest. This does not seem likely, but the Scientific Department would be very glad to have particulars from any Tea planter who has had experience of this matter.

Bone Meal.—A sample of milled raw bone submitted to me recently was found to contain :—

Insoluble matter	...	2·04%
Phosphoric Acid	...	24·16%
Nitrogen	...	4·40%

It was guaranteed to contain 3·5 to 4% of Nitrogen and 22 to 23% of Phosphoric Acid.

If we take the figures given by the Government Chemist in his '*Note on the Indigenous Manures of South India*' published in 1912 as a basis, *viz.* that Bone Meal containing 3·5 to 4% of Nitrogen costs Rs.65 per ton, and consider that a pound of Nitrogen costs 7·6 annas (see these notes in *P. C.* IX 2). we can calculate the value of one pound of Phosphoric acid in Bone Meal, and this proves to be 8·7 pies. On this basis the value of the plant food in the sample under examination is for Nitrogen Rs.46-13-0 and for Phosphoric Acid Rs.24-8-4, making a total of Rs.71-5-4.

As a matter of fact this fertiliser cost Rs.78 per ton, and the extra Rs.7 represents the cost of milling, bagging, &c., and any rise in price of Bone since 1912, the year on which our figures are based.

The Sampling of Fertilisers.—At the last Annual meeting of the U. P. A. S. I. when discussing the fertiliser guarantees which had been checked, and in two cases found wanting, by the Scientific Assistant for Mysore, some of the representatives of Manure Firms expressed themselves as dissatisfied with the way in which the samples for analysis had been drawn. In view of this and the fact that the guarantees of fertilisers supplied to Mysore planters will be again checked this year by the Scientific Assistant the following method of taking samples of fertilisers for analysis laid down by law in Switzerland will form a useful guide.

"In the case of manures and feeding stuffs, samples of at least 4½ lbs should be taken from the sacks, barrels, boxes, etc., (if possible with a sampling tool). A partial sample must be taken from every tenth sack, barrel, box, etc., or if the consignment comprises less than 50 packages, then from at least every fifth package; if there are less than five packages, each one should be sampled. The samples should be taken from different parts of the mass, and not only from the surface. They should not be taken from sacks whose contents have deteriorated or become damp in transport. If the goods are in a heap, the sample must be taken from in the mass, and not from the surface. These partial samples must be carefully mixed on a clean dry surface and all lumps should be broken up. From this mixed mass three clean and dry wide-mouthed bottles of about 1lb. capacity must be filled immediately; they must be corked and sealed with wax or lead."

The Planting Expert.—Mr. Anstead left Bangalore on Thursday, 29th January, for Ootacamund. From there he proceeds to Yercaud arriving on 2nd February. He will make a short tour of the Shevaroy Hills and expects to be back at Headquarters about 12th February. Letters will be forwarded to him during his tour.

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

Bababudin Planters' Association

Minutes of a Meeting held at Arabidacool Estate, on 21st January, 1914.

PRESENT.—Messrs. A. B. Boyd (President), A. C. W. Denne, F. Hugonin, W. St. C. Johnson, H. Kerr, R. D. Lovett, G. R. Oliver, H. Watson, O. Watson, and N. Kirwan (Honorary Secretary). *Visitors*:—Messrs. W. McQueen, G. N. Frattini and D. W. Meppen.

The Minutes of the last meeting were taken as read.

(1) The Minutes of the last Council Meeting were read.

It was decided that samples of soil from Messrs. Denne's, Johnson's Courpalais' and Lovett's Estates, and one other, be sent to Mr. Frattini for analysis.

(2) *Labour Rates.*—It was resolved "That rates may be raised from March 1st, but not earlier."—Carried. 7 for 2 against.

(3) *Labour Commission.*—A general discussion on this ensued, but no fresh instructions were given to Delegates.

(4) It being late and members having to get back Mr. Frattini's address was postponed until he goes to Santaveri on the 23rd. Mr. Frattini being asked as to the amount of Spraying ingredients advisable to be stocked for Green Bug, gave the following notes. About 80 gallons of mixture are required per acre, which works out to about 23 trees to the gallon. 3 pounds of the ingredients go to each gallon of mixture. Soda Ash had many advantages over Soda, and only half the quantity was required. Care must be taken after boiling the mixture to re-measure and bring it up to its original bulk, or it may be too strong. Leaves burnt at the tips resulting at a recent use of Soda Ash was attributed to this. In conclusion if members stocked 1 cwt. of each ingredient it should be sufficient to tackle an outbreak of Bug.

(5) *Co-operative purchase of Manures.*—Mr. Frattini addressed the meeting on this subject giving examples of the saving to be effected in buying in large quantities, etc. Messrs. Denne, Kerr, and Hugonin were appointed a Sub-Committee to deal with the question.

A hearty vote of thanks was accorded to Mr. McQueen, representative of Messrs. Nobel's Ltd., for the interesting demonstration of Sub-Soiling he had given.

(Signed) NOEL G. B. KIRWAN,
Honorary Secretary,

RUBBER PAVING.

The announcement now definitely made that the Rubber Growers' Association will pave the new Ward at Guy's Hospital with rubber was foreshadowed in the article by "F. C. R." published by us over a week ago. The gift is part of a campaign for promoting new uses of rubber. It was stated that sufficient scrap rubber would be given by companies to make a pavement. Before it is given to the hospital, however, it will be on exhibition. It will be used as the floor of the Rubber Growers' Association office at the Rubber Show, where the Association will temporarily instal itself for the duration of the Show.—*The Weekly Times of Ceylon*.

RUBBER.

R. G. A. Standardization Committee.

FURTHER EXTRACTS FROM THE REPORT.

Recommendations for Estate use in matter of Rubber Preparation.

INTRODUCTORY.

The object of the present memorandum is to put before those who are responsible for the preparation of rubber on plantations a summarised statement of the present position of the knowledge of how rubber should be prepared so as to turn out:—

(1) A product of the highest quality;

(2) A product showing as little variation in quality as possible.

At the very outset a formidable difficulty presents itself in that no definite standard of quality exists, and that there is no existing organisation for ascertaining the actual quality of rubber when offered for sale.

Both these difficulties are under consideration, and a scheme is being drawn up which it is believed will remove them.

Rubber as prepared on the plantation is a raw product. Its value depends upon the qualities of the vulcanized rubber; what these will be cannot be accurately predicted by any inspection or hand testing of the raw substance.

It therefore follows that the quality of any sample of raw rubber cannot be settled except by tests of the vulcanized product, and the quality revealed by these tests it is proposed to call the "Real quality."

Up to the present, there being no organization for ascertaining the "real quality" of rubber, it has been valued on what may be termed the "apparent quality," that is to say, the general appearance of the rubber in the raw state as regards strength and elasticity, as determined by brokers' "rule of thumb," colour, marking of the surface of the rubber, freedom from apparent impurities, such as bark, earth, etc., freedom from mould, water, and stickiness,

The procedure upon an estate must, therefore, in the present state of our knowledge, be organised so as to satisfy the double requirements of obtaining a high "real quality," and at the same time maintaining the "apparent quality."

All the indications at present point to:—

Smoke curing, no addition of water to the latex, the use of the minimum amount of acid for coagulation, and general cleanliness as improving the "real quality," and to

Dilution of the latex, excess of acid, dirty working, and heavy machine working of the rubber as injuring the "real quality."

In addition to the problem of how to produce rubber of as high "real quality" as possible, there is the further problem of ensuring that the various grades, not only from one, but from all estates, shall be of constant quality.

While the difference of equipment of estates may render the production of absolutely identical qualities impossible, the Rubber Growers' Association puts forward the following practical suggestions as to manufacture (originally drafted by Mr. Morgan) as likely to help in achieving the foregoing desired aims.

The Association recommends that they be acted upon, and serve as a guide in the preparation of rubber on all estates.

POINTS TO BE OBSERVED IN THE TREATMENT OF LATEX AND THE CURING OF RUBBER.

(1) Cups must be of a type which can easily be cleaned. They must be kept perfectly clean always. Glass or glazed earthenware cups are the cleanest. Metal cups or cocoanut shells should be avoided.

(2) Buckets and other utensils should be selected with a view to ease in cleaning, and should be kept absolutely clean. Vessels made of copper, or any alloy of copper, should be avoided. Kerosine tins or receptacles with similar angles should also be avoided.

(3) Water in cups.—In most cases addition of water is quite unnecessary. A little clean water may be used, in very dry weather, when the latex tends to coagulate very quickly. In some instances a little formalin may be added, but application should be first made to the laboratory for advice before using this reagent.

(4) Water on cuts is not advisable. Often the latex coagulates as a result of employing water on fresh cuts.

(5) Bark shavings and other impurities must not be allowed to remain in the cups, They cause latex to coagulate.

(6) Coagulation of latex.—Latex must not be allowed to stand in the field. The earliest opportunity for collection should be taken. It is recommended that in collecting the following grades be recognised and kept separate :—

(*a*) Clean uncoagulated latex ; (*b*) Lump, coagulated in the cups ; (*c*) Rinsings from the cups.

(7) Transport of Latex. Every possible means of facilitating quick transport should be taken. Light trolley-ways are strongly recommended where ever possible.

IN THE FACTORY.

Reception of Latex.

(8) (A) Preliminary treatment. The latex should be received if possible on a verandah, so that there is no necessity for coolies to enter the store. There would thus be no excuse for the presence of dirt in the factory.

(9) Supervision.—The reception of latex must be under direct European supervision. Causes of defects in the finished rubber are thus often made clear.

(10) Cleanliness in utensils and methods is absolutely necessary; any neglect in this respect is inexcusable.

(11) Straining of latex must be thorough. There should be no excuse for the use of broken mesh.

(12) Bulking of latex is strongly recommended where circumstances allow it. The mixing of all latex undoubtedly tends to produce a rubber of greater uniformity. Until there are facilities of ascertaining the "real quality" of all rubber prepared, it is recommended to bulk all latex.

(13) Addition of water to latex in the store is not necessary, except in such an extreme case as when latex is too thick to pass easily through the strainer.

(14) B. Coagulation.

Coagulant.—Acetic acid is recommended as the best coagulant at present.

(15) Strength of solution. Acetic acid to be made up in stock solutions of one pint commercial acetic acid to 20 of *pure* water. One gallon of this stock solution to be used for every 50 gallons of pure undiluted average latex. While it is not desired that water be added to the latex if it is possible to do without it, it is advisable to point out that dilution of the latex by as much as three times does not necessitate the use of more acetic acid.

Suppose 50 gallons of average undiluted latex has, by the addition of water in the cups or otherwise, been diluted to 100 gallons, then for complete coagulation only one gallon of the stock solution would be required for the 100 gallons of diluted latex.

(16) Mixing of acid and latex must be thorough. It is best effected by means of broad wooden paddles. Sticks must not be allowed for this purpose. The scum should be removed and added to the rinsings from the cups:—

(*a*) For the preparation of crepe rubber any quantity of latex may be coagulated in bulk;

(*b*) For sheet rubber, under ordinary circumstances, not more than 50 gallons of latex should be treated with acid in one batch, as the latex sometimes coagulates before all can be poured out into dishes. It is sometimes expedient to add water to the latex, or to use a diluted solution of formalin to prevent rapid coagulation. In such cases advice should be obtained from the laboratory.

PREPARATION OF RUBBER.

(17) The interval between coagulation of latex and preparation of rubber must depend upon factory conditions. The morning following coagulation is adjudged to be the best time for working off the fresh rubber, but no great gain in strength of product is obtained In comparison with that obtained in an interval of four hours.

(18) Amount of working.—The extent to which rubber is worked on the machines must be the minimum necessary. As the extent of working is increased, the strength of the product is diminished.

(19) The thickness of the rubber determines the rate of drying. The pale crepes should be thin; the other grades need not be quite so thin. Sheet rubber should never be thick. Sheet and medium crepe should be about $\frac{1}{8}$ inch in thickness.

(20) Smoke curing.—Sheets must always be as uniform in thickness as is possible, and the period of smoke curing should also be uniform. Greater strength is obtained by smoke curing beyond the period necessary to ensure dryness alone.

CARE OF MACHINERY.

(21) Defects in crepe rubber are generally due to lack of attention to machines.

(22) Machines must be well cleaned and inspected each day before commencing work. At frequent intervals (say, once per week) they should be well cleansed of all traces of oil by means of a 5 per cent. solution of caustic soda. This must be applied under European supervision, by means of a cloth fastened to the end of a stick. Afterwards the machines should be set in motion and the water allowed to run for some time, say ten minutes.

(23) Lubrication.—The engine driver should be solely responsible for this work.

(24) Worn parts must be replaced at once. Worn "bushes" are often the cause of "green streaks" in crepe rubber.

(25) Trays projecting beyond the ends of the rolls must be condemned, and narrower trays substituted.

SORTING AND PACKING

(26) Sorting must he thorough, and no rubber of varying shades of colour should be packed together.

(27) Grading must be done thoroughly, on the lines laid down by the Company. All sorting, grading and packing must be under European supervision.

(28) Boxes. Opinions differ as to the suitability of boxes employed in packing, but there exists no doubt that boxes should be of planed wood only; splinters in the rubber are highly undesirable.—*The India-Rubber Journal.*

SOIL.

Notes on the Sub-Soiling Demonstration.

Three plots of ⅓rd of an acre each were treated.

In the first two plots a piece of coffee 12 years old was treated. The surface soil was hard, with gravel. A pit dug at the bottom of the plot showed a layer of boulders about 2 feet deep, below this a layer of quartz, while at 4 feet the red clay was reached.

In another pit about half the way up, the red clay was reached at 3 feet. A cutting further along shows the bed of clay for 10 feet and it had not then reached the bottom.

During the drilling of the holes this clay was reached at various points at varying depths, the shallowest being about 1 foot.

The third plot in another place was in a somewhat typical heavy red clay. The coffee here was very bad. This type of land occurs in patches all along these hills. The shade grows, but the coffee will not.

In plot 1 the charges were placed 10' x 10', two rows full cartridges, 3 rows half cartridges. Depth of hole 2 feet.

In plot 2, the charges were placed 15' x 15', 2 rows half cartridges, and three rows full cartridges. Depth of hole 2 feet.

In plot 3, the cartridges were placed 12' x 12' all full cartridges, and the holes 3 feet deep.

The Explosive used was Nobel's Gelignite, slightly more powerful and more expensive than the "Farmers Dynamite" which is now being imported especially for this work.

Before lighting the fuse the end of the fuse was opened to the powder and a small piece of Gelignite inserted, this enabled the fuse to be fired by merely touching it with a lighted cigarette.

After the charges had all been fired Mr. McQueen pointed out that with the half cartridge at 2 feet depth the surface soil was not much displaced. This was as it should be, the force of the explosion was all expended in the soil. The full cartridges at 2 feet deep displaced the surface soil to some extent, showing a waste of force above ground. The full cartridge at 3 feet deep appeared very effective. The shock could be felt 30 and 40 yards away, but the surface soil was not displaced.

To demonstrate the fallacy that Dynamite strikes downwards, whereas it really takes the line of least resistance, Mr. McQueen placed a cartridge on the road and covered it with a Kerosene Oil tin.

The road was hardly marked, but the tin has not been seen again. A trial hole was also bored in a road, 2 feet deep. A full cartridge inserted and fired. The cracks could be traced on this hard surface for 3 feet 6 inches.

A tree stump was also blasted. Owing to coolies having used the wood augurs as earth augurs at a previous demonstration it was impossible to bore into the tap-root to a sufficient depth. The tree was a dead gall nut, and very hard. Holes were bored as nearly below the tap-root as could be

guessed, and the charge fired by electricity. One side of the tree was torn out and a piece weighing over a cwt. thrown clear over the coffee on to a road about fifteen yards away.

Later in the evening 9½ cartridges were placed on a block of wood stone measuring about 3' x 4' x 6' total 72 c. feet. These were covered with wet clay and the whole fired off together. The stone was cracked from top to bottom and several transverse cracks also made. Mr. McQueen said the same effect could have been produced by 3 cartridges inserted in a drilled hole in the usual way, so it is not economical. Mr. McQueen's table of the costs per acre at varying depths and charges is appended. The costs of drilling the holes was not very accurately demonstrated as several methods were tried to see how they panned out. A steel crowbar driven with a heavy hammer was found to be the most expensive, as the crowbar stuck and took time to get out again. A medium sized hammer avoided this and was effective. Perhaps the most effective combination was an 18 lb. 4 feet steel crowbar for the first 18 inches or more used without a hammer, finishing with an earth augur. It was found difficult to get down the 3 feet holes without the augur. With this combination 8 coolies, with one for water, did the second plot of 100 holes in 2 hours. This contract however could be considerably enhanced.

COST OF SUB-SOILING PER ACRE.

Distance in feet ...	10 x 10	11 x 11	12 x 12	13 x 13	14 x 14	15 x 15	20 x 20
Number of holes ...	435	360	302	258	222	194	109
Lbs. Explosive ...	52	45	38	32	28	24	14
Total Cost 1 cartridge @ 2 ft. deep ...Rs.	68	56	47	40	35	30	17
Total cost ½ cartridge 2 ft. deep ...Rs.	48	40	32	27	23	20	12
Total cost 1 cartridge 3 ft. deep ...Rs.	72	60	50	43	37	33	18

Note.—The above costs are based on the following figures.

Nobel's Farmer's Dynamite at 12 annas per lb. of 8 cartridges.

Nobel's No. 3 A. Detonators at 3-4-0 per 100.

Nobel's Common Fuse at 4 annas 3 pies per coil of 24 feet.

Above "Ex Magazine" Bangalore.

Rail Freight at 11 annas per Maund (*Minimum 54 Maunds*) to Kadur Station. If less than this quantity is taken by rail the *Minimum Freight* has to be paid on it

Cart-hire in Bangalore and from Kadur Station to estate at 10 - per ton.

Labour is not included in the above estimate. Probable cost from 2-8-0 per acre, downwards.

CORRESPONDENCE.

The Labour Commission.

THE EDITOR,

The Planters' Chronicle.

Sir,—I have tried to fathom Mr. Newcome's letter on the Labour Commission in your issue of 3rd January, and after reading it through several times, I confess I am quite bewildered, and "have given it up." Mr. Newcome begins by comparing Mr. Danvers to Mr. Lloyd George. Some men may think this a compliment, some the reverse, any how Mr. Danvers is quite able to defend himself!!

Mr. Newcome then totals up Government Taxes, Scientific Fund, and Labour Trust (the last he draws up on a line of his own) and compares them to an *Income tax*, and *War tax* in England!!! What have these to do with one another? Why doesn't he throw in land tax, rates and taxes in England, and while he is about it, doctors' bills, or some such incongruous items? He then virtually attacks Managers of Companies, who are accused of risking money, because it does not belong to them, but as he puts it, "to a confiding public"!! Are men who are risking their own money, the only honest men? Mr. Newcome then proceeds to tear to pieces the Trust that he has created, and a perfect Demon he has made it, and shows how labour is not to be controlled by this Demon; but that one must be a good Superintendent (he does not tell us his ideas of a good Superintendent), the estates must be in a good climate, with good communications, and supply of food cheap. Then he harks back to his "Trust Demon," who will invade this ideal district (with model superintendent, good climate and cheap food), and claims that the unscrupulous Manager and a "Bogey" called a "Bagman" will be introduced with "its your labour we want writ large," and a virtual slavery established. Mr. Newcome then turns legal adviser, and shows us how Government is only waiting for the Demon, and how he will be laid low, being less trouble to deal with than a number of individuals. Then comes a vista of his happy district, where rogues are few, and when detected, differences are amicably settled. It is quite easy for anyone to give Mr. Newcome the advice, if he lives in such an Arcadia, "Don't join the wicked Labour Commission." Few planters have their lives thrown in such happy spots as Mr. Newcome describes. They cannot change the climate where their estates are situated, nor can they regulate the food supply, but they must do their best to keep the flag flying, and their estates going, and they *must have labour*, which they find they are losing every day; and it's to *keep their labour*, they are trying to raise the Labour Commission, and so fight the Labour Commissions from Ceylon and the Straits, in self protection. This Labour Commission is a very difficult scheme. We are not all of the same way of thinking by any means, and a good opposition will bring out weak points, so we ought to be thankful to Mr. Newcome, for giving his views: if a few delegates like Mr. Newcome, representing the opposition, would attend the meeting at Bangalore, it would be a good business, and help the "full blooded optimists" to frame rules to meet the objections of the opposition.

But why create a Trust all on your own lines, and then proceed to tear to pieces the Labour Commission, that has not been formed on those lines at all, and attack the Managers of Companies, who after all are only trying to do their best for their Companies, and perhaps intend to cut down expenses in some other way to meet this labour tax. Mr. Newcome has his labour established. "Lucky man": well the Labour Commission will certainly help him to keep it, I believe, and not lose it—this is the view of a

MANAGER.

THE EDITOR,

The Planters' Chronicle.

Sir,—A good many of your readers appear to think that a Labour Commission, if started, on much the same lines as the Ceylon Commission, would not work successfully. I should like to ask them how many maistries or coolies in their experience default to them FROM (1) the Ceylon Labour Commissioner (2) the Kanan Devan Hills.

In the 4 years of which I have had planting experience I have personally known only one case of the former, of the latter I have yet to hear of a case, and only a few days ago I heard a planter say that he had not had a single instance in 15 years, though maistries and coolies defaulting from any and all other districts are common enough.

The moral should not need to be emphasised.

Yours faithfully, A. C. C,

THE EDITOR,

The Planters' Chronicle.

Sir,—I have read with interest the many letters, articles and reports of District Planters' Association Meetings that have appeared in your *Chronicle* at intervals during the last few months bearing on the proposal to establish a Labour Commission for South Indian Estates. If you will kindly permit me to trespass upon your valuable space to some small extent, I should like to draw attention to one of these letters in as far as it affects the credit of the Ceylon Labour Commission, as, if unchallenged, it is liable to create a wrong impression amongst those of your readers who are not well acquainted with my methods. I refer to Mr. Newcome's letter of 24th December, a paragraph of which reads as follows:—

> "Ceylon and Straits both have Commissions, yet one hears of whole-
> "sale crimping, ill-feeling, scarcity of labour and numerous cases
> "of Kidnapping and worse by the native staff."

It is somewhat difficult to understand whether Mr. Newcome refers to Ceylon or the Ceylon Labour Commission, or both, when he mentions wholesale crimping and kidnapping, but, in each case, you will note that he comments upon hearsay evidence. As regards the charge of crimping, the Commission itself can be absolved entirely, seeing that it undertakes no direct recruiting, and in cases where it has been brought to my notice that recruiters, utilising this Commission for passing coolies into Ceylon, have helped themselves from labour under advances to South Indian estates, I have several times been able to put matters right, a fact which has received courteous acknowledgment on more than one occasion. I shall always be ready to use my authority in this way, whenever information is furnished to my Commission, without which it is not possible for me to act. I feel sure that when unanimity of action is arrived at by the South Indian Planters, Ceylon will receive equal treatment which is eminently desirable, if friendly rivalry is to exist.

With regard to the numerous cases of kidnapping and worse quoted by Mr. Newcome as having been affected by my native staff, there has never been a conviction for such an offence. It is not always wise in this country to give credance to all one hears, and I feel sure that those amongst your readers who are aware of the work of this Commission and my arrangements to safeguard the interests not only of the recruiter, but of the recruited, arrangements which I hope to further amplify in the near future, will not be ready to accept such statements without very much more definite evidence than can be extracted from Mr. Newcome's letter.

Yours faithfully, H. SCOBLE NICHOLSON,

Trichinopoly, 24th Jan., 1914. *Ceylon Labour Commissioner.*

Kesinvurthy Estate,
Santaveri, Birur, S. M. Ry.,
24th January, 1914.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—I have followed the above question, as well as I could during my absence from India, but have failed to see what good it would do us here and in North Mysore,

However yesterday I picked up my *Madras Mail* and glanced through the proceedings of the Nilgiri Planters' Association and Mr. Barber's speech, and thought to myself, here is a little ray of sunshine! I fortunately skimmed through these proceedings, which I have since read carefully, before reading the Executive Committee's Report forwarded to us through our Honorary Secretary, Bababudin Planters' Association, as had I read this Report and overlooked the N. P. A. Meeting, nothing would have induced me to have had anything to do with the Labour Commission. For as far as I can see nothing whatever is said of what we are going to get for our money, but some talk of "making a splash that would frighten the others and let them know . . . . . "

By others I suppose F, M. S. and Ceylon are meant. That's all very well from some people's standpoint, but if we haven't been frightened, we have very nearly lost our crop this year, and inside competition is of course responsible for this in the first place.

But to revert to the Hon'ble Mr. Barber's speech. If what he says is going to be carried out in the event of the money being forthcoming, why cannot the District Association be circularised to that effect.

Mr. Barber shows very clearly how we shall benefit, and I agree, if I may say so, with every word, especially *re* advances, and am very glad of Messrs. Finlay's stipulation No. 3. If only our advances can be reduced and become good instead of bad, I at all events shall not lose over the Commission.

Speaking for myself on my Estates here the more advances have increased, the more insecure the money has been. We have no system and no cooly or maistry ever completely pays off an advance, before he gets another one. In my humble opinion an absolutely rotten state of affairs.

I must say that the reading of Mr. Barber's speech, together with the action of Messrs. Finlay & Co., in agreeing to join hands with the Commission and offer the able services of Mr. Martin, has converted me and I hope many others.

Before I read the Speech I naturally asked the question, "Who is going to be Chief Commissioner and how long will it take him to learn his job, etc."

To revert to the Proceedings of the N. P. A. Meeting. I must say before concluding, that Mr. Nicolls is rather hard on his poor brothers in Coffee. Tea was at one time not without its difficulties, which have long since, I am glad to say, passed away and are forgotten, and Coffee is now the Cinderella of the Family, and when Mr. Nicolls says is their coffee moribund? I reply there is coffee and coffee and I don't want to cry "stinking fish," but I am not ashamed to say that I own a share in an Estate, which has seen better days, and which does not pay a "very exciting rate of interest to some of its shareholders. It is also of considerable area and the contribution to the Labour Commission, added to other contributions, together with the raising of rates, will leave a still smaller margin of profit, if any.

I have also another small moribund coffee estate, which I bought with the intention of converting into a rubber estate. There is rubber, at least

we call it so, but it has pretty nearly eaten all that came out of the coffee, some of which was fortunately spared.

I might whisper, although I hardly like to do so, that there are others in worse cases. You see we have unfortunately only this one product to rely on, as so far nothing else has been grown profitably. I mention this as there seem to be rather vague impressions about, as to what is grown in Mysore.

Hoping Mr. Editor that I have not unduly taken up your space.

Yours faithfully,
G. R. OLIVER.

Kotagiri, 28th January, 1914.

Small Proprietors and the Labour Commission.

THE EDITOR,
Planters' Chronicle.

Sir,—Since the last meeting of the Nilgiri P. A. it has been pointed out to me that no small owner need be expected to join the Labour Commission and pay Rs.2 per acre for 5 years if his losses on account of advances are practically *nil*.

Quite so, but I presume that the safeguarding of advances is not the only object for which he would be asked to join. What the Commission intend first and foremost to safeguard is a sufficient connexion with the labouring classes, so as to check the present drain to Ceylon and the Straits.

I take it that any owner may lose more than Rs.2 per acre per annum through failure of coolies to arrive in sufficient numbers—a small coffee man, for example may easily lose a bushel or two of crop per acre (to say the least) if his coolies are not on the spot to tackle the Green Bug on its appearance, and the same loss may occur in crop time.

If we have not some organised scheme, we cannot prevent coolies from listening to other recruiters before our own men can get near them.

Yours faithfully.
F. M. COCKBURN.

Preserving Bamboo Baskets.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—In reply to Mr. Anstead's inquiry in your issue of January 17th, a friend has informed me that before use, he sprays his planting and crop baskets with liquid fuel and says that this not only doubles their life but that white ants won't touch them.

Yours faithfully,
B. CAYLEY.

Sholarock Estate,
Katary P. O., Nilgiris,
26th Jany., 1914.

Tea.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—I wish I could give you the information your foot-note to my letter of 16th instant, suggests, but this is impossible for the simple reason that the leaf was sold to a large factory, and so got mixed up with that fctory's manufacture. I did however get 100 lbs. of leaf manufactured separately in a friend's factory, and sent part of each grade to London for Report.

I may mention that 100 lbs. leaf was from the *very first plucks* in September 1912, when the bushes were well under 2 years old; the following is the opinion of the gentleman in London, and may interest readers:

"I have had experience of Nilgiri tea for more than 20 years and am very pleased with general make and appearance. The quality of the tea is like most Nilgiri teas, it has flavour and distinction, but is rather lacking in strength and body."

The lack in strength and body may be accounted for on account of the tender age of the bushes when first plucked.

Yours faithfully,
PHIL. BEAVER.

KANAN DEVAN PLANTERS' ASSOCIATION.

Letchmi Estate,
Munnar P. O.,
24th January, 1914.

A Correction.

F. NORTON, ESQ.,
Secretary, U. P. A. S. I.,
Bangalore.

Dear Sir,—The Directors of the K. D. H. P. and A. A. D. T. T. Companies have taken exception to a portion of one of my speeches on the Labour Commission as reported in the *Planters' Chronicle*, and which was a mistake on the part of those responsible for printing the proceedings. I refer to that portion in which I was reported to say that under certain conditions the above Companies' Labour Commission *would* join the general scheme. This was not so. I distinctly stated that having no instructions I could commit my Association to nothing definite. That under any conditions, whether the local Members of the Association were favourable to the Scheme, or not, the definite consent of all Owners and Directors would first have to be obtained. I think we all agreed upon this.

The only reason for the mistake, as far as I can see, is that I further stated after the Committee's Report and Estimate had been submitted, that if the scheme could be worked as cheaply as was hoped, those Directors and Proprietors who were at present running more expensive Commissions of their own *might* be induced favourably to regard a General Scheme as proposed and that my Association and Proprietors would gladly welcome any feasible scheme that would tend to check the continually increasing rate of advances, control competition, prevent crimping and absconding of advanced labour and at least obtain for us the same privileges as Government were affording to Recruiters for Foreign countries. Beyond this, I distinctly stated I could go no further and could make no definite statement one way or the other with regard to the Labour Commission at present run by the above Companies. Kindly insert this in the next issue of your paper.

Yours faithfully,
ERNEST A. HUGHES,
Honorary Secretary.

[We regret the printers' error that has crept into the Report of Mr. Hughes' Speech. It was quite understood by all the Delegates that Mr. Hughes distinctly stated that he could not commit his Association or Proprietors and that only under certain contingencies his Association *might* support the scheme. The substitution of the word *would* for *might* has altered the whole pith of Mr. Hughes' Speech.—ED.]

How to take Samples and send Specimens for Examination:

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether and is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part in 20 of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzene. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent, if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE,

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The tapping of rubber is a subject of constant attention and frequent correspondence and argument. After experiments by the F. M. S. Board of Agriculture it was found that the ideal form of tapping was the Basal or Single V shape, which showed results better than the half herring-bone.

Under the heading of Tea we reproduce an Entomological article which gives a history and method of damage done by the Red Borer, with a full description from its birth onwards.

We reprint an interesting article on the Review of Rubber for the past year. The fall in the prices will have, and no doubt has already had, the effect of reducing the cost of production; and in this plantation rubber has the advantage over wild rubber, "which can only be produced at a profit by entire abolition of many of the export taxes and the actual granting of subsidies to those who are collecting rubber."

Mr. Petch, in the *Tropical Agriculturist*, writes a very interesting article on the slope of the tapping cut. The number of cuts to the inch will be interesting reading to Rubber Planters.

Some extracts on Nitrogenous Fertilizers are taken by R. D. A. from Bulletin 17 of the United States Department of Agriculture by Mr. J. A. Turrentine. The extract about Nitrolim, which is being now so extensively used, will be read with interest.

The Extraordinary General Meeting to discuss the Establishment of a Labour Department of the U. P. A. has been convened for March 4th. Considering its great importance it is hoped that it will be a thoroughly representative one. This meeting is not expected to last more than two days.

For the first time for many issues, we greatly regret that our Correspondence columns are devoid of a single letter. We trust that this does not mean that the interest shown in those pages is evaporating.

TAPPING.

Basal or Single V Tapping.

In reply to the challenge which appeared in your Journal of 18th October last, I would like to take up the cudgels in defence of the above system of tapping.

Starting off on the safe assumption that the planting is fairly wide, say, not more than 100 trees to the acre, I think there is no doubt that four years is sufficient for renewal of bark. This being admitted, I think it would be difficult to find a better system of tapping than the above. The first year a V is marked on one-half of the tree 15 or 18 inches from the base, and the second year is a V of the same height on the other side, while the third year you mark out your V 15 or 18 inches above the top of the first year's cut, the fourth year being the same height above the second year's work. On the fifth year you come back again to the first year's work and providing the tapping has been good, the bark will be found to have renewed perfectly. It is only a matter of opinion whether you allow 15 or 18 inches for a year, but I think it is better to allow the 18 inches, which gives 20 cuts to the inch, as although many tappers could do with less, there are always a certain number who need the full 1½ inches a month.

Speaking of the northern end of Malaya, I can say that nearly all of the estates are now tapping on the basal or single V system, and this is all the more remarkable when it is remembered that although nearly all the estates started on that system, they mostly changed over to the half herring-bone quarter system some years ago, and after giving that system a trial of a year or so, have almost all come back to the basal V. It will, I think, be admitted that this is very good proof of the superiority of the basal or single V tapping, as no manager would leave his present system of tapping to go back to an old one unless he found that he was not getting the yield that his trees might be expected to give. One great point in favour of basal V tapping is that you are never for more than a year tapping on the same side of the tree as on one V becoming finished you change over to the other side. It is well-known that it is not advisable to tap the same side of a tree for a long period of, say, two years, or even under, as the latex yielded occasionally decreases instead of increasing as the tapper gets nearer to the ground. Also the cuts of the V system, which, of course, go round exactly one-half of the tree, seem to draw out more latex than, say, the cuts of the herring-bone quarter system, in which, no matter how many cuts there may be, are all on the same quarter of the tree. Although two cuts in this system are equal in length to the two cuts in the V, perhaps it is not unnatural to expect that the cuts extending half round the circumference of the tree should give the best yield, and it is generally found that they do.

The F. M. S. Board of Agriculture have experimented with most systems of tapping, so as to find the ideal one, and they have found that the basal or single V system is superior to any other. In the *Agricultural Bulletin* for April of this year are given the results of the following six different systems:—Half herring-bone, alternate, single V, daily; double V, alternate; opposite quarters (2 cuts in each quarter), alternate; and the results over a period of two years are as follows in lbs:—372; 362; 420; 357; 320 and 266. It will thus be seen that the system of tapping condemned in the article in question, actually produced 48 lb. more rubber in two years from 65 trees than the half herring-bone, quarter system, and 58 lb. more

than the full herring-bone with alternate day tapping. The article from which I cull these figures is well worthy of study by anyone who has the slightest doubt as to the system of tapping best suited to Eastern plantations.

It must be understood that though the system is called basal or single V tapping, the cuts are not made at an angle like the sides of the letter V, but form an angle of about 120 degrees, in fact just enough slope is given to allow the latex to flow freely down the cut into the channel, which is short, as the spout can be placed immediately below the cut, and thus very little latex coagulates on the trees. This is another point in its favour, as with other systems, such as the half or quarter herring-bone, unless two glasses, which will add to the cost, are used, much first quality latex is lost, and has to be collected as scrap.

Having given figures which go far to prove the superiority of the system in regard to yield of latex, I need only say that the amount of bark erased is small, being the same as the quarter herring-bone with two cuts, and therefore little or no injury is done to the tree. Again, the cuts are never more than three feet from the base, less if the tappers employed are really good, and so chockrahs (children) who, as most planters know, make quick and good tappers are employed, can be brought down to a very low figure, as the common task given is from 400 to 450 trees, which can be tapped before the heat of the sun is strong enough to retard the flow of latex.—*The India-Rubber Journal.*

Coffee.

With the market closed so far as public sales are concerned, there has been no alteration in prices. Privately very little has been done, although a few parcels of foreign cleaned Costa Rica of May and June import have been sold at a fair advance; that was quite the cheapest time of the year, for since then there has been a steady though gradual appreciation of all home trade kinds. In the Santos market there have been various fluctuations, the quotations in the terminal market at the present time being about 5*s.* dearer than in August, but 18*s.* lower than at the beginning of the year. The present Santos crop is proving to be larger than was estimated, and if the next Rio crop is to be 3 million bags, which is the last estimate, it is not likely that the Santos will be only the small amount of 6½ million bags as some predict. Should it be 8 million bags it appears almost certain that there will be sufficient carried forward from the present crop to equalise the deficiency. It must be borne in mind, however, that the Valorisation Committee have stated that they will not sell any Coffee during 1914.

London Coffee Returns.

	Home Consumption.*		Export.		Stock.	
	1913. Tons.	1912. Tons.	1913. Tons.	1912. Tons.	1913. Tons.	1912. Tons.
For week ended December 20	235	256	328	275	10,353	8,702
For 51 weeks ended December 20 ...	14,551	16,249	21,172	16,820	—	—

*The Home amount contains a proportion for Export delivered by cart.

—*The Produce Markets' Review.*

TEA.

Entomology.

ZEUZERA COFFEÆ (Red Borer; Coffee Borer).

This insect is widely distributed in Ceylon as a pest of tea, and it is often sent to the Entomologist under the impression that it is the shot-hole borer though the resemblance is slight as well between the insects as between their manner of work. In the respect that its attack results in the death of the branch attacked it is more serious than the shot-hole borer.

Its presence is indicated by the withering of the leaves and by the castings of the caterpillar which lie on the ground. The castings are oval-cylindrical in shape and yellowish or crimson in colour.

If such a branch is cut open, a tunnel, widening out at irregular intervals will be found, running along its centre. These wider portions are of the nature of lateral galleries that may reach almost to the outside. The width of the tunnel depends on the age of the caterpillar. The galleries of the young larvae are usually straight, and without the wider region that are characteristic of the galleries of older larvae. Narrow and wider galleries may be found in the same branch. They may be continuous or they may not. The narrower galleries are obviously the older, and are found in the thinner twigs; their entrances are small but I have never seen any so small as those of shot-hole borer; they have been found as leaf scars, and in the angle between a twig and the main stem. In certain cases the larvae seem to work continuously downwards; in other cases they seem to leave a tunnel in the upper part of the branch and come lower to enter at another point from which they burrow upwards as well as downwards.

In several cases where a caterpillar has been present it has been in a tunnel that was being driven upwards. In one case a larva in its upward journey had entered a pruned stem; but, evidently finding the condition of the wood not to its liking, it had stopped short about ¼ inch from the cut surface, had returned on its track and gone into a living branch, where it was found feeding.

The galleries may be so extensive as to girdle the stem; they may also go down into the roots.

When full grown the larva cuts a circular trap door for the exit of the moth, and spins a loose silken web on the walls of the burrow and pupates. The pupa lies with its head towards the trapdoor, from which it is sometimes separated by a plug of frass.

In the course of the galleries one often finds a tunnel leading to the outside and almost closed at the inner end by a silken membrane with which frass is incorporated.

Are these the holes at which the castings are ejected?

A variety of insects has been found in the tunnels and in some cases these have been mistaken for the real culprit. In one case an old gallery was tenanted by a colony of six or seven slender, blackish brown ants with larvae and pupae. A nymphal locustid was using another gallery as a retreat, and in still another a cockroach had deposited its egg-capsule.

Specimens of branches have been sent in that suggest that white ants had made use of the galleries of the caterpillar to commence operations on the branch.

The appearance of the caterpillar varies, but the following description will enable one to recognise it :—

It is that of a full-grown or nearly full-grown caterpillar about 1 7/8 inch in length.

The head, first and second thoracic segments and eighth, ninth and tenth abdominal segments are brownish. The rest of the body is of a glossy pinkish or purplish colour.

On the dorsum of the first thoracic and ninth and tenth abdominal segments are smooth, glossy shields.

The prothorax is somewhat humped and its shield bears dark brown areas on its anterior and posterior edges. The posterior dark brown area is composed of backwardly-directed processes, broad and rounded at the apex. These, no doubt, assist the larva to progress in its burrow. The most anterior row contains the largest spines and they are arranged thus from the middle line—two large, one smaller, two larger, many smaller.

The ventral surface is brownish-yellow.

There are three pairs of true legs, four pairs of abdominal prolegs and a pair of anal prolegs. The hooks on the abdominal prolegs are arranged in a circle, those on the anal prolegs in a transverse, slightly curved band.

The body is sparsely covered with long, white setae.

The mandibles are stout, black and toothed.

When molested the caterpillar exudes a dark-brown fluid from its mouth.

The caterpillar described above gave rise in confinement to a pupa 11/12 inch long.

The larvae do not thrive well in confinement, and the smallness of this pupa, as compared with the size of the larva, was probably due to shrinkage in the larva owing to a dearth of suitable food, as it did not pupate till several weeks after it had been obtained.

This pupa is of a chestnut-brown colour and shining.

It is of much the same diameter throughout till near the apex of the abdomen where it narrows rapidly.

The anterior end is of a very dark brown colour, is sculptured and provided with a short snout.

The abdomen is provided with 12 or 13 transverse bands of backwardly-directed spines. These bands stop short a little distance below the level of the siracles, but on the ventral surface there are on each segment two groups of three spines each besides two isolated spines. Ventrad of the anus there are several distinct spinous tubercles.

These spines provide the mechanism by which the pupa crawls to the exit hole just prior to the issuing of the moth. The abdominal region is very soft and easily injured.

The imago of Zeuzera coffeæ may be recognised from the following description which is adapted from Hampson :—

Male—Expanse 40mm.; each of thoracic segments with a pair of small black spots. Abdomen black, clothed with white hairs. Fore-wing with small black spots. Hind-wing with a few black spots.

Female—Expanse 46mm. Spots on fore-wing fewer but more prominent and tinged with metallic blue.

The moth flies by night.

Hampson gives its distributions as Nago Hills, Rangoon, Nilgiris, Ceylon and Borneo.

He refers, in error, to its larva as the "White Borer." "White Borer" is the larva of a Cerambycid, Xylotrechus quadripes, Chevr.

It is difficult to form a reliable estimate of the damage done by "Red Borer" in tea. One correspondent remarks, "It is causing considerable loss in the nurseries." Another is more definite and estimates that 15 per cent. of the trees in one field are attacked.

It has been found feeding on the following plants in Ceylon.—Tea, Coffee, loquat, cotton, avocado pear, "china apple" orange, grevillea, teak, Cassia auriculata, cinnamon, Erythroxylon. S. P.

In India it is recorded from tea, coffee, sandal and cotton.

Control.—It will be observed that it is a very general feeder and, therefore, difficult to deal with.

It should be destroyed wherever, and in whatever stage, found.

Affected branches should be cut down till untunnelled wood is reached and the larva or pupa in the tunnel killed.

Sometimes, as when the tunnel goes below the ground or into the body of the bush, this is not possible.

In such cases the pruning should be carried as low down as possible, and the tenant of the gallery killed by prodding with a sharp wire or by putting into the gallery a piece of cotton wool saturated with Carbon bisulphide and closing the hole.—A. RUTHERFORD.—*The Tropical Agriculturist.*

COFFEE.

Some time since it was reported that Colombia expected a record crop of coffee this year. Partly owing to the inaccessibility of some of the plantations and partly to the difference in altitude, it often appears as it that country had three crops in a year, as there are three periods when new crops arrive. In October—November much of the good quality, grown on some of the best estates is received, and the first shipments are just coming forward. The auctions, therefore, have been rather better supplied, and the trade being generally ready buyers, most of the catalogues have been cleared at full or almost top prices. Whether the advance which was established in this growth six weeks ago can be maintained is questionable, if supplies come forward in any large quantity. Of other growths East Africa is sending an increased quantity, but nothing compared with what is promised during the next few years when the new plantations come into bearing. The numerous districts where coffee is grown are sometimes rather confusing, one broker having recently had four descriptions in a small catalogue of under 400 bags, which might all have been classified as East African. The offerings of Costa Rica are still confined to second-hand parcels, but picking is reported to have commenced in August, so that new crop may arrive now at any time. The terminal market has remained steady, reports as to the next crop having been much the same as last week. —*The Produce Markets' Review.*

RUBBER.

Review of the Year.

Raw Materials.

Fall in Price.

Undoubtedly the greatest event of the year has been in connection with the fall in the price of all grades of rubber. This has been particularly the case with the plantation product, which started practically paralled with fine hard Pará at 4*s.* 6½*d.* in January, and fell to very near 2*s.* in the latter part of the year. This fall in price, however, has not been unaccompanied by good results. There has never at any time of the year been any accumulation of stocks of plantation rubber. The quantity which has been sent forth has been on a very large scale, but so far warehousing of plantation rubber has presented no difficulties owing to the immediate distribution, after sale, which has been effected in connection with almost every shipment.

The rapid manner in which plantation rubber has been distributed points to the fact that at least a very large number of manufacturing concerns throughout the whole world have seen the advantages of using plantation rubber. Plantation rubber during the year under review has taken a hold in the making of manufactured articles which very few anticipated. As years go on and manufacturers find the best method of dealing with the plantation product, we anticipate that it will become the predominant type in the market. If the fall in the price of plantation rubber has done nothing beyond leading to an increased use of that product, we think there has been one very substantial benefit accruing therefrom.

But as is well known, it was not the only good effect. The price received for plantation rubber in the latter part of the year was such as to show a loss to many growers. Under such circumstances, those companies which were in a sound position have been able to effect economics in the costs of production on the estate and in Europe; there should be a reduction in many cases of from 25 to 50 per cent. in the costs of production a year hence. That can hardly be said to have been achieved with wild rubbers. Wild rubber, especially those from Africa, can only be produced at a profit by entire abolition of many of the export taxes, and the actual granting of subsidies to those who are collecting rubber. The fall in the present level has therefore brought to a test the question of economies in all rubber collecting centres, and to our way of thinking there can be only one result; that is the supremacy of the plantation product.

Price of Fine Hard and Plantation.

Again we have seen a very erratic relationship exhibited between the prices of first grade plantation and fine hard Pará. Up to the end of April the two premier types practically ran with each other as far as price was concerned. It was only in the month of May that the big break occurred, fine hard being sold at about 3*s.* 10*d.* as against 3*s.* 4*d.* for first grade plantation rubber. Since that time there has been a disparity of from 9*d.* to over 1*s.* per 1*lb.* in favour of fine hard. This difference can be attributed to various causes. In the first case all dealers and manufacturers realise that fine hard Pará, a product on which they have been very largely dependent in years gone by, is not going to arrive in increasing quantities. On the other hand, the plantation product is one which is going to show a very large annual increase for many years to come. In view of these facts it is easy to see how the financing of fine hard Pará may be accompanied by less risk than the financing of the plantation product.

In the second place, fine hard Pará in virtue of its chemical and physical properties, is used in preference to all other grades by quite a large number of the most eminent manufacturing firms. We believe that fine hard Pará will always hold its own as far as characteristics are concerned; in the long run the fight will be between fine hard Pará, or fine Brazilian grades, and plantation rubber only. Fine hard Pará is absolutely essential for many manufactures to-day, but we have good reason to believe that if the plantation product can be offered in definite standard grades, and manufacturers can be taught to take advantages of its good properties, that the premier position in point of utility of fine hard will be lost.

Smoked Sheet and Crepe.

During the year there has been no new type of rubber brought forward; methods of preparation have, in fact, been very much the same excepting in so far that there has been the introduction of more "Universal" washing machines for the treatment of bark and scrap grades. At the present time sheet and crepe are the two main types, though it must of course be admitted that Ceylon biscuit still exists, and that block rubber is still being prepared on one or two well-known estates.

The price paid for smoked sheet has practically throughout the year been higher than that for best quality crepe, though at certain times of the year the price paid for special blanket or special pale crepe has been very near to that for smoked sheet. Sheet rubber, smoked and properly ribbed, has been the type asked for. We believe that smoked sheet will prove, in most respects, superior to other forms, but we are aware of the fact that crepe, of the pale or clear amber type, has certain uses to which smoked sheet could never be put. In fact the introduction of pale clear crepe from plantations has led to the use of rubber for purposes which in the past there was no demand. If pale or clear amber crepe were done away with certain market novelties would no longer enjoy the demand which they have experienced during the past year. The quantity of rubber used for this purpose is large, and we therefore hope that crepe will not pass out of existence.

Furthermore, the premium paid per smoked rubber sheet, despite the efforts made by certain Committees, will not be maintained. Smoked sheet has been very largely sold forward, and is now being prepared in very large quantities on Eastern plantations. In a very short time there will be more smoked sheet than has been called for, and we shall not be at all surprised if a premium for crepe is established. Intrinsically, however, we must point out that smoked sheet in virtue of the facts that it has a ribbed surface which prevents moulds, that it is smoked and its decomposition thereby prevented, and that it is prepared without being subjected to the tearing, as in the preparation of crepe, must be fundamentally the superior type.

Africans.

Moderate supplies of Africans have come forward during the year, the arrivals in London and Liverpool amounting to about 3, 000 tons. West African grades have been largely held by importers for higher prices, but arrivals from East Africa have sold at current values; the better qualities have been in fair request, good red ball and spools always finding a good demand. Lamu ball has been in fair supply, and good pinky sold readily. White Mombasa ball was slow of sale. Supplies of Abyssinian were small during the early part of the year, but latterly larger quantities have come forward; though in good demand stocks are being held for higher prices. The quality of this rubber has varied, and recent shipments contained a large proportion of spongy lump. Madagascar grades have been in fair request; smaller quantities than usual were imported into this country.

Lately good pinky has been well enquired for at comparatively high prices; low grades, however, were difficult to sell.

Plantation rubber from East Africa (most Ceará) arrived at first in larger quantities, but afterwards fell off in amount. The quality has shown improvement. Brown crepe sold well. Nyasaland has sent more plantation rubber (Ceará), some of very good quality.

The arrivals at Antwerp from the Belgian Congo during 1913 amounted to about 2,886 metric tons, against 3,229 metric tons in 1912. The amount would probably have been larger but for the fact that various companies—the Kasai in particular—held back shipments in anticipation of the abolition of export duties.

The following table exhibits the value of Congo sorts in francs per kilo. at end December, 1912, and end December, 1913: —

	Dec. 31, 1913.	Dec. 31, 1912.
Kasai Red I	5·25	11·30
„ „ (Loanda II)	4·0	9·25
„ block	5·25	11·30
White sorts (Equator, Ikelemba, Lopori, etc.)	5·25	11·30
Upper Congo Ordinary	5·25	11·30
Aruwimi, Uele	5·25	11·30
Congo Wamba Red "grass" (rubber) ...	3·50	7·90

VARIOUS.

About 450 tons of Mangabeira came forward from Mattogrosso, against, perhaps, 500 tons last year. Mattogrosso virgin was in good request, but negrohead was slow. Colombian, West Indian, and Central American rubbers were in small supply. Malaysian met a steady sale, and was in fair supply. Quality has been good, and America and the Continent have taken large quantities, while it is stated that more has been used by manufacturers in this country—*The India-Rubber Journal.*

The Slope of the Tapping Cut.

In a recent bulletin on Hevea tapping, Dr. A. W. K. de Jong has, among other things, dealt with a point which is often overlooked. It is that the amount of bark removed per annum, or the number of cuts to the inch depends upon the angle which the tapping cut makes with the vertical channel.

Suppose, for example, that the tapper is using a knife which can be adjusted so as to remove a definite breadth of cortex at each cut, and that it is desired to put on twenty cuts to the inch. The first impulse would doubtless be to adjust the knife so that it should cut off a strip one-twentieth of an inch wide. But that would not give twenty cuts to the inch reckoned vertically. The thickness of the strip removed is measured perpendicularly to the tapping cut, and hence twenty cuts to the inch, with the knife adjusted as stated, would remove one inch perpendicular to the cut. What that amounts to, reckoned vertically, depends on the angle of the cut. Only if the cut were horizontal would the removal of strips, each one-twentieth of an inch wide, give twenty cuts to the inch reckoned along the vertical channel.

Now in marking out the trees, the distances are measured along the vertical channel. Therefore, if any one calculates that by removing a strip

one-twentieth of an inch broad per tapping, and placing the cuts 1 foot apart along the channel, he will be able to tap for 240 days, he will find himself sorely disappointed. It is readily seen that the parallel-sided strip removed in tapping is cut obliquely by the vertical channel, and hence the length which is removed vertically is always greater than the thickness of the strip. If the angle of the tapping cut were 30°, then twenty cuts to the inch, removing a strip one-twentieth of an inch thick each time, would remove two inches reckoned vertically.

That this point is frequently overlooked is evident from a recent compilation which includes elaborate tables giving the amount of bark removed per annum in daily or alternate day tapping, for strips of given thickness, regardless of the fact that in actual practice the thickness of the strip is measured perpendicular to the cut, while the amount of cortex removed is measured along the vertical channel.

This fact was recognised in "Bowman and Northway's marker" which consisted of a tin isosceles right-angled triangle, with its hypotenuse 2 feet in length and each of the other sides 17 inches. Distances of 17 inches, measured along the vertical channel, give cuts one foot apart measured perpendicular to the cut, if the angle is 45°.

Dr. de Jong has carried out an experiment which shows completely the relation between the amount of bark removed and the angle of the cut. Three groups, of ten trees each, were tapped by the same tapper for the same period. In the first group the tapping angle was 36°, in the second 42°, and in the third 56°. The vertical strips of cortex removed in the same number of tappings measures 302,288 and 270 centimetres respectively. These are in the ratios of 1 : 0·95 : 0·89, while the ratios which should theoretically have been obtained are 1 : 0·9 : 0·7. In general terms, the steeper the cut, the greater the amount of cortex removed, reckoned vertically.

It may be suggested that this fact may account for the differences of opinion regarding the number of cuts it is possible to make to the inch. Some authorities state that twenty-four should be obtained, while others regard eighteen as good. The difference might be accounted for, if it were the practice to reckon the cuts across the tapping surface in the one country, and along the vertical channel in the other. For, with an angle of 45°, twenty-four cuts to the inch reckoned perpendicularly to the cut, is seventeen cuts to the inch reckoned along the vertical channel.—T. PETCH.—*The Tropical Agriculturist.*

NICARAGUA.

Coffee Exports in 1912.—The Acting British Consul-General at Managua reports that, according to official statistics, the total exports of coffee from the Pacific ports of Nicaragua in 1912 amounted to 6,162,711 kilogs., valued at about 1,773,000 United States dols. (about £364,000). Of this amount 338,901 kilogs. went to the United States 2,270,034 kilogs. to Germany, 856,483 kilogs. to the United Kingdom, and 2,119,543 kilogs. to France.

The 1913 crop is stated to be of very poor quality owing to lack of rain in the months of May to November, 1912.—*The Board of Trade Journal.*

Kilog. = 2·2046 lbs.

SOIL

Nitrogenous Fertilisers.

In Bulletin No. 37 of the United States Department of Agriculture Mr. J. W. Turrentine deals with the subject of Nitrogenous Fertilisers obtainable in the States. The following extracts are made from this interesting Bulletin :-

"Present agricultural practice requires that nitrogenous matter be supplied to the soil supporting crop growth. At one time it was the belief that all the nitrogen found in the substance of the plant had its origin in that added to the soil as a fertiliser. Now, however, it is definitely known that this is by no means true in the case of certain types of plants and that the uncombined nitrogen of the atmosphere is made available for plant metabolism through the instrumentality of lower organisms inhabiting the soil. The marked accumulation of nitrates in certain soils of Colorado has been explained on the basis of the bacterial fixation of atmospheric nitrogen. Nitrogen combined as nitrate of soda occurs naturally in the arid plateau region of Chile. It also occurs in certain of the rainless portions of the United States. In this country, however, it occurs as so small a proportion of its carrier that its extraction therefrom under present conditions is commercially impracticable. Aside from this occurrence, combined nitrogen is found in nature only in the complex compounds constituting the organisms of plants and animals or arising from the decomposition of these. In small amounts it is found in the soil in the form of certain organic compounds, some of which are tonic in their action on growing plants, and some beneficial.

"The nitrogenous compounds comprising animal and vegetable tissues constitute the principal foods for man and animals. In general it is true, therefore, that only in those instances where their occurrence is such as to preclude their ready marketing or where portions of them for one reason or another are unfit for food, are they available for fertiliser purposes. There is one striking exception to this generalisation. In the destructive distillation of coal for the preparation of gas and coke the nitrogen present in the coal is evolved, in part at least, as ammonia. This is easily recoverable and in the form of ammonium salts constitutes an important source of nitrogen for fertilizer purposes.

"The agronomic necessity which compels the use of nitrogenous fertilizers and the scarcity of nitrogenous compounds available for fertilizer purposes together make the nitrogen carriers of extremely great importance."

Sodium Nitrate.

"Sodium nitrate occurs naturally as an impregnation of earthy and saline material, known as caliche, on certain of the arid uplands of Chile. The names of Chile nitre, and Chile saltpetre have been given to this product because of its occurrence."

The composition of this caliche is as follows:—

Sodium nitrate	60·97
Sodium iodate	0·73
Sodium chloride	16·85
Sodium sulphate	4·56
Calcium sulphate	1·33
Magnesium sulphate	5·88
Insoluble matter	4·06
Water	5·64
	100·00

The Sodium Nitrate is washed out of this and crystallised and refined to a more or less pure state. In its pure state it is a colourless, crystalline substance containing 16·47% of Nitrogen; the commercial nitrate usually contains 15·5% of Nitrogen.

"In past years the amount of nitrate of soda was so much in excess of that of any other nitrogenous ingredient of artificial fertilizers that the world has been regarded as being dependent on nitrates for its supply of these. The more intensive agriculture of recent years has emphasized the demand for nitrates. Their use has increased at such a rate that the beds have been threatened with exhaustion. However, the demand for nitrogen carriers has served not only to increase the output of natural nitrates, but likewise has stimulated the manufacture of other nitrogenous substances suitable for fertiliser manufacture, so that the world's dependence on Chile is yearly growing less. In fact, during the year 1912 there was a marked falling off in the nitrate trade, there being an enormous substitution of other nitrogen carriers for nitrates. This falling off is said by the producers to be due in large measure to high freight rates and to labour difficulties at the deposits.

"During the last few years the Chilean beds of nitrates have been surveyed and figures have been obtained which make possible a fairly close estimate of the amount of nitrate remaining there. This is in itself immense, but at the recent rate of increase of consumption the supply is destined to exhaustion in a few generations. Since the report of these estimates, however, it is claimed that there have been certain improvements in the methods of extraction which admit of a more perfect recovery of the nitrates."

Calcium Nitrate.

"The recent rapid development in the manufacture of nitric acid by the electrothermal fixation of atmospheric nitrogen has made artificial nitrates commercially important."

"Three well-known processes are employed in the direct oxidation of nitrogen to oxide—the Birkland-Eyde, the Schoenherr, and the Pauling—the processes differing chiefly in the design of the electric furnace and plant installation rather than in the chemical reactions involved.

"It is claimed that the Birkland-Eyde process of manufacture yields 500 to 550 kilograms of nitric acid or 850 to 940 kilograms of calcium nitrate for every kilowatt-year of electrical energy expended. The Norwegian hydro-electric nitrogen companies now are utilizing about 200,000 horse-power in the manufacture of nitrates and nitrites."

"The composition of commercial calcium nitrate manufactured by the Birkeland-Eyde process is as follows:—

Calcium oxide	25·83
Nitrogen	12·47
Water	23·83
Carbon dioxide	0·52
Magnesium oxide	0·41
Aluminium oxide	0·71
Isoluble matter	0·51

Nitrolim.

"Calcium cyanamide is perhaps the most nitrogenous material manufactured for fertiliser purposes. It is prepared from calcium carbide and free

nitrogen, the latter being prepared from the atmosphere by the removal of Oxygen. The reaction between the two substances may be represented by the following equation :—

$$CaC_2 + N_2 \qquad CaCN_2 + C$$

Calcium carbide Calcium cyanamide

"The product is a grey powder. In addition to nitrogen it contains a high percentage of calcium and some finely divided carbon. In the soil it reacts with water to produce urea and lime, the former being acted upon further to form ammonia."

"The composition of commercial calcium cyanamide (Nitrolim) is as follows :—

Calcium cyanamide	45
Calcium carbonate	4
Calcium hydroxide	27
Calcium sulphate	1
Carbon (free)	14
Iron and Aluminium oxides	2
Silica	2
Combined water	4
Free moisture	1

Tankage and Dried Blood.

"Tankage is a product from the abattoirs, consisting of the waste materials, such as bones, horns, hoofs, hair, the trimmings of hides, and some blood. After treatment for the recovery of glue the mass is dried and ground and then sold for fertilizer purposes. As the proportions in which these ingredients enter vary, the composition of tankage varies widely. Its nitrogen content is said to vary between the values of 5 and 8 per cent., and its phosphoric acid content between the values of 5 and 12 per cent. Some of the nitrogen of tankage is regarded as unavailable, by which is meant that it is present as a part of nitrogenous matter which is more resistant to the agencies of decay and therefore is only slowly available."

"Dried Blood is perhaps the richest in nitrogen of all the organic materials used in the fertilizer industry. Unadulterated blood when quite dry contains 14 per cent. of nitrogen, but as obtained on the market its content of that element varies from 9 to 13 per cent."

R. D. A.

Tea.

The export of tea declined somewhat during 1912, only 24,023,306 lbs., valued at £689,660, leaving the island compared with 26,044,743 lbs., valued at £730,270, during the previous year. The decrease was entirely in Oolongs which receded some £117,000 ; Pouchongs advanced about £77,000. The decline in the former was natural when the special circumstances of the 1911 export are considered : this was stimulated by the stoppage of competition from Chinese tea in the United States market owing to the coloured tea difficulty, and the resumption of competition from China in 1912 naturally affected Formosan tea exports adversely.—*Diplomatic and Consular Reports, Japan.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether and is on a level or slope near a river, &c., and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil.

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part in 20 of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzene. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent, if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE,

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer has returned from tour but only remains a few days at Head Quarters before going to Coorg. He contributes an article of general interest.

The Proceedings of the Central Travancore Planters' Association are published. Mr. Richardson's speech on labour in support of the Labour Department is well worth reading as it emphasizes the report of the Executive Labour Committee, and warns those districts that are well supplied with labour at the present, that this blissful state of matters from past experience is not likely to continue. We congratulate the Central Travancore Planters' Association on being the pioneers in Motor Traction and only wish that Government would take the matter up in a business like way, thus standardizing motor lorries throughout India. But this is too much to expect from our paternal though inert Government, who will take the matter up when too late to benefit the public service.

The Anamalai Planters' Association Proceedings are also published. They are short. The para on the Labour Commission should be read and the complimentary resolution passed to Messrs. Finlay & Co. on their public spirited action is well merited. We regret that the International Rubber Exhibition has not been generally supported.

Two letters on Tea are printed and we trust that Mr. Beaver will reply and supply the information asked for.

Mr. Martin kindly sends a corrected report of the remarks he made at the meeting of the Nilgiri Planter's Association and we would draw attention to the remark that if the Labour Department is established, active help will be accorded to those who recruit coolies through the Department.

We have received with thanks a blotting pad from the Agent of Nobel's Explosives which is a great adjunct to the writing table. It also contains a diary perforated for tearing out and a Calendar for 1914.

We also have to thank Messrs. Peirce Leslie & Co., for a useful blotting case which contains a Calendar.

THE SCIENTIFIC DEPARTMENT, U. P. A. S. I.

The International Congress of Tropical Agriculture.—The third International Congress of Tropical Agriculture is to be held in London during the last week of June. The members of the organising Committee of the British section, whose headquarters are at the Imperial Institute, have arranged for a series of meetings to be held there, and invitations to participate in the proceedings are being extented to all countries which are interested in Tropical Agriculture and Forestry. Papers and discussions will be devoted at the morning and afternoon sessions to subjects of general importance and of special interest. Among the topics which are suggested for treatment by contributors are technical education and research in tropical agriculture; labour organisation and supply in tropical countries; scientific problems of rubber production; methods of developing cotton cultivation in new countries; problems of fibre production; agricultural credit banks; agriculture in arid regions; and problems of tropical hygiene and preventive medicines. Special attention will be given to methods and proposals for promoting the cultivation and production of rubber, cotton, and fibres, cereals, and other food-stuffs, tobacco, tea, coconuts, and other agricultural and forest products. A volume of printed papers and discussions is to be printed and presented to all members of the Congress which will be under the Presidency of Prof. Wyndham Dunstan of the Imperial Institute.

During the period of the Congress facilities will be afforded to members to visit the International Cotton, Fibres, and other Tropical Agricultural Products Exhibition, and also the Rubber and Allied Industries Exhibition which have been arranged to be held at the same time at the Royal Agricultural Hall. In addition to trophies and medals for cotton and rubber exhibits exceptional inducements are held out for the exhibition of almost every prominent variety of tropical product, inculding sisal hemp, and coffee, and of agricultural machinery applied to their cultivation and preparation for market. Inquiries on matters connected with the two exhibitions should be directed to Mr. A. Staines Maunders, 75 Chancery Lane, London, W. C.

As the Planting Expert will be at home on leave while this Congress is being held, he has been asked by the Council of the United Planters' Association of Southern India to attend it on their behalf.

Bamboo Nursery Baskets.—In reply to my enquiry on this subject in the issue of 17th January, a planter in the Shevaroys kindly informs me that a friend of his sprays his planting and crop baskets with liquid fuel and finds that this not only doubles their life, but that white ants will not touch them after the treatment. Another correspondent who says he has used baskets and basket plants for quite thirty years, kindly sends me the following note on the whole subject.

"I find the best plan is to put the baskets on about five inches of river sand, and then if the baskets do get spoiled, the plants can be removed with a well defined ball. I recommend sprinkling a little Apterite on the top of the sand; this prevents all kinds of insect pests. On no account should dry earth be used to fill the baskets; it should be damp but not too wet. If the baskets are filled with dry soil it will harden on being watered and turn into a sort of brick. If the soil is heavy, it is a good thing to mix a little sand with it before putting it into the baskets; burnt earth is also an excellent thing."

The need for a Mycologist.—In a preface to a series of articles on the Fungi which attack Tea appearing in the Quarterly Journal of the Scientific Department of the Indian Tea Association, Mr. Tunstall the Association's Mycologist says that, "on an average at least ten lbs. of tea per acre over the whole of the tea districts of North East India are lost every year as the result of chronic fungus disease alone. The term chronic is applied to those diseases which individually rarely do sufficient damage to render their presence noticeable but which are to be found on most gardens at all times of the year. In addition to chronic diseases there are others which may be referred to as epidemic diseases. In the latter class those fungi such as Blister Blight, erratic in their appearance, but which cause very extensive damage, are included. The monetary loss incurred cannot be accurately estimated as so many things have to be considered: but over the whole of the districts of North East India it would exceed two hundred thousand pounds sterling per annum. It is obvious that some systematic effort should be made to reduce this large sum."

"Before devising an economic treatment for any particular fungus disease it is advisable to find out by scientific investigation as much as possible about its manner of life, and by so doing ascertain the point in its life history at which it is most vulnerable and when it is most probable that combative measures will be successful. A consideration of those diseases from the scientific point of view is therefore necessary in order to fully understand the various practical treatments suggested."

This work can only be carried out by a specially trained Mycologist with a laboratory and small experiment station at his command, and the need for such a man and station in the Scientific Department of the U. P. A. S. I. is an urgent one. Mr. Tunstall's remarks about the damage done by fungoid diseases to Tea apply equally well to Rubber and Coffee. A number of fungi more or less affect Rubber trees, and the abnormal leaf fall complained about recently is probably due to the effects of a fungus. In Coffee Black Rot, which is a fungoid disease of the leaf, alone reduces the crop on some areas by twenty five per cent.

The Planting Expert.—Mr. R. D. Anstead returned from a short visit to the Shevaroy Hills on 12th February. While in the Shevaroy Hills he visited a number of estates in the Nagalur District and attended a special meeting of the Shevaroy Planters' Association held in the Victoria Rooms at Yercaud on 10th February. The meeting was devoted to an informal discussion upon matters of local agricultural interest and was well attended. The future of the Scientific Department was also briefly considered.

Mr. Anstead leaves Bangalore again on Sunday, 15th February, to make a tour of Coorg. He will be accompanied by Dr. Coleman, who at the request of the Coorg Planters' Association has been given permission by the Mysore Durbar to make a tour of inspection in Coorg with Mr. Anstead. Dr. Coleman is especially interested in the Lantana eradication work which is being carried out in Coorg, and in the outbreak of Green Bug on the Coffee, but the opportunity will be taken to inspect all the planting industries of the district and the various interesting experiments which are being conducted with Tea and Rubber. Mr. Anstead will probably be back at headquarters on or about 8th March, but letters will be forwarded to him as opportunity occurs as usual.

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

Central Travancore Planters' Association

The Annual General Meeting of this Association was held at Penshurst Bungalow on Saturday, 31st January, 1914, at 10 a.m.

PRESENT.—Messrs. F. Bissett (Chairman), T. C. Forbes (Vice-Chairman), J. A. Richardson, W. H. G. Leahy, J. S. Wilkie, F. Winterbotham, J. H. Ellis, H. C. Bracher, R. D. Scoble Hodgins, A. R. St. George, R. P. Roissier (Honorary Secretary) and W. E. Forbes (visitor.)

The Notice calling the Meeting was read.

The Proceedings of the last Meeting were confirmed.

Honorary Secretary's Report.—Mr. Chairman & Gentlemen.—During this year under review we have held 4 Committee Meetings and 4 General Meetings.

Labour and Labour Rules.—The same rules as existed last year have been carried on. The proposed Labour Commission has occupied our minds ever since the last U. P. A. S. I. Meeting and it is to be hoped that this Commission will get the necessary support. The acreage support promised by this District up to date is 4,594 acres.

Labour Rates.—The rates were revised early in the year and were passed at the last January Meeting.

Roads.—There is little for me to say on this subject but I feel sure that we are all eagerly awaiting the Annual Meeting of the Road Committee when we shall hear the result of the past year's work and also know what is to be done as regards improvements for the future. With reference to the Peermade-Mundakayam Ghat Road Government some time ago promised us Water Troughs on this Ghaut. We are now once more into our dry weather and as far as I am aware there has been no start made yet to provide these troughs. The Kottayam-Kumili Road is being put in good order.

Membership.—The Association consists of 13 members representing a declared acreage of 5838·73 acres.

Crop.—The crop for the year 1913 was 2,920,218 lbs.

ACCOUNTS.

Receipts—		Rs.	A.	P.
By balance from last year ...	...	230	8	3
By subscriptions for 1913 ...	...	1,376	1	11
By Bank Interest	...	20	9	0
	Rs...	1,627	3	2
Expenditure—				
To expenditure for 1913 ...	...	1,303	11	6
To balance brought forward ...	...	323	7	8
	Rs...	1,627	3	2

Mr. Wilkie kindly consented to audit the accounts and lay detailed accounts on the table.

In conclusion I wish to thank the Chairman and Committee for their support during the past year.

I now beg to tender my resignation.

Finance.—The accounts for the past year having been circulated the Hon. Secretary said that he estimated that it would be necessary to call up subscriptions for 1914 at the same rate as last year namely 3½ annas per acre.

Mr. Richardson proposed: "That subscriptions for the year 1914 be at the rate of 3½ annas per acre." Seconded by Mr. Leahy. *Carried.*

Correspondence.—Read U. P. A. S. I. Circulars Nos. 21/13 of 17th November 13; 23/13 27th November, 1913; 24/13 of 4th December; 25/13 of 12th December and a Circular letter of 21st January, 1914.

Read letter from Mr. St. George dated 2nd January *re.* rates. Read correspondence from the Resident of Travancore and Cochin and from the Hon'ble Mr. Barber relating to the recent judgment made by the Sessions Judge at Kottayam. Read telegrams and letters from the Secretary, U. P. A. S. I. relating to the Labour Commission. Read letter No. 4116'6'358 of 15th November from the Excise Commissioner. Read letter No. C. 13848 of the 15th November from the Durbar Physician. Read letter No. 1463 of the 19th November from the Chief Engineer, also letter dated 4th December from the Chief Engineer, Trivandrum. Read letter dated 23rd January from J. Irvine, Esq,

Sri Mullam Delegate—Mr. Wilkie having been elected as Delegate, Mr. Leahy proposed: "That the delegate be given Rs.50 towards expenses." Seconded by Mr. Winterbotham, and *carried.* Mr. Wilkie thanked the Meeting.

Labour.—Mr. Richardson spoke on the Labour Commission as follows:—

Gentlemen,—The question of a Labour Commission, to improve the conditions of Labour on the estates of South India, has been before us for some months now. I feel that, there is little I can add to what has been already said and written on the subject, but the results of the Labour Commission Meeting in Ootacamund have considerably advanced the condition of affairs and also I think enhanced the prospects of success for the scheme. One of the largest planting Companies in Southern India, with a fully organised Labour Commission of its own (which has been proved to be of great benefit) has decided to join the proposed Labour Commission on certain conditions. I refer to the Kanan Devan Produce Company who have also agreed to hand over their Labour Commissioner Mr. A. F. Martin, whose large experience of the work and knowledge of the natives of Southern India makes him far and away the best man for the job. The conditions laid down by the Kanan Devan Company stipulate that at least 100,000 acres of the planting area of Southern India join the scheme and bind themselves to subscribe at the rate of Rs.2 per cultivated acre for a term of five years. This will no doubt seem a heavy tax but it is no more than many of us are paying at the present moment. I think that it is evident to all that a scheme of some sort to protect the planting interests is very necessary and the fact that such a large concern as the Kanan Devan Company, who have already a well-organised Labour Commission should think it advisable to join the general scheme should go a long way to influencing the doubting ones to join and I hope will lead many more who have been against it from the beginning to give their support.

There will no doubt be an extraordinary meeting of the U. P. A. at an early date to discuss the whole scheme when I hope the required acreage will support it.

Certain districts are against the Commission as they consider that they have plenty of labour at the present moment and seem confident that this will always be the case with them but I do not think that the argument can be upheld in the face of previous experience in other parts of South India. My advise to these over-sanguine districts is that they should look on the investment as an insurance against the future as I feel sure the time is not far distant when they will have their labour troubles like their less fortunate neighbours. In this connection I may mention that one of these fortunate districts which admittedly at the present moment is well supplied with labour has not escaped bad advances as I have had occasion to prove for myself through visiting some of the estates.

As you will have seen from the report of the Labour Commission meeting they have got definite promises from 30,000 acres and the conditional promise of support from another 50,000 so that it looks as if there was a good prospect of the required acreage coming in and if this acreage gives support there is little doubt that the balance must follow suit, and I should like to see every acre that is represented in this Association joining in.

From correspondence that I have had from home there is no doubt that Directors and Proprietors are beginning to realise the importance of the scheme and I hope that you will give your Delegate or Delegates whoever may be appointed to attend the Bangalore meeting, full powers to give support to the Labour Commission of Southern India which I think you will all agree is badly needed.

A discussion of some length took place on the subject of the Labour Commission and finally it was decided that a Committee be formed and be called the Labour Commission Committee and which would go thoroughly into the matter of this Commission and which would also have the power to elect a Delegate or Delegates for the extraordinary meeting of the U. P. A. S. I.

Mr. Richardson proposed the following Committee be appointed: Messrs. Leahy, Forbes, Westaway, Roissier, Bissett and Richardson. Seconded by Mr. Wilkie and carried unanimously.

Mr. Bissett spoke upon the system of Tundus in this District and said that he did not approve of the way in which these Tundus were now being given when in many cases Headmoney and Interest were added on to the amount of the Kanganies and coolies debts on the Tundus. It was resolved: "That in future no Headmoney or Interest is to be added to Tundus on coolies passing from one Estate to another."

Labour Rates.—Mr. Forbes addressed the meeting as follows:—

"In the Agenda it is put down as Labour rates and there is no resolution in my name but with the consent of the meeting I should like to propose one. The rate I wish to bring before meeting is men's wages. I do not particularly refer to pruners as, though it is not recognised by the Association nor entered as such in the C Roll, by the manipulation of the daily task all our good pruners receive 6 annas or more per day. I consider the time has come when all men should be rated at 6 annas. The usual argument is that it is an easy matter to raise rates but a very different matter to reduce same. This is an incontrovertible argument, but if you take into consideration the increased cost and higher standard of living in the last few years I do not think an increase of 1 anna a day is in any way excessive. We were paying 5 annas 17 years ago in the High Range surely 2% in 17

years is not very much. To my mind this 6 annas for men has to come and it is surely better to give it in time than run the risk of losing our labour when it will take much more than this extra anna to entice it back again. I really think there is a grave risk on this question. To get sufficient men for our requirements entails recruiting a larger labour force than the estate really needs. This results in poor pay and discontent all round.

We must move with the times and a comparison with Mundakayam shows what I mean. This district has changed a lot in the last few years. From a cooly's point of view the climate is as good as Peermade. Lines are good. Foodstuffs cheaper and they always can get sack rice which for some reason or other they now-a-days seem to prefer. Tapping cannot be called hard work. The Mundakayam district employs Moplah Ghat and Coimbatere Tamils. You will all agree that the Coimbatore does not compare with our Tinnevelly cooly and our Tinnevelly is certainly as good as if not better than a Canara, still these people are not only paid 6 annas a day as wages but their rail fare is given free and even I understand the estates provide them a free ride from Kottayam by the motor bus. To cover all this for the Canara at all events it must come to more than Rs.5 per head. On an 8 months' agreement this works out at about half an anna a day.

A six anna rate for all men would not I am convinced make any or only a very slight difference in our annual expenditure and any slight increase would be justified by the better class of work done. Most estates, have to employ Boyens at some time of year and their work is generally bad and horribly expensive. I am referring more especially to the cutting of manure pits, cleaning out drains, and this class of work. If C/Roll men were sufficient in number the Boyens need not be employed which would result in cheaper and better work and a bigger gang of weeders available when there was no other works going en.

I do not say by giving this 1 anna increase there will be at once a great influx of men coolies, but it may stop the decrease and we shall certainly be able to get at our Kanganies a bit more and force them to bring a bigger proportion of more men. At present their agreements are irrefutable.

I now bring up my resolution: "That the rate of men be raised to six annas from 1st May 1914." Seconded by Mr. Hodgins. Mr. Leahy opposed this resolution and after a lengthy discussion Mr. Forbes withdrew his resolution as the feeling of the Meeting was that it should be brought up in six months hence and this was decided upon.

Rates.—It was resolved that the present rates be carried on for another period of one year.

Labour Rules.—It was resolved: "That the rules be carried on for another period of one year but that in Rule 3 the wording be altered to 3 months instead of 2 months."

Rubber Exhibition.—Mr. Forbes proposed "that as there is practically no Rubber in this District this Association does not see its way to join in the annas two cess per acre. As to the main product Tea, if it is advisable to be represented at the exhibition it is a matter for the Tea Cess Committee." Seconded by Mr. Leahy.—Carried unanimously.

Ropeway.—Mr. Richardson in addressing the Meeting on the Ropeway said:—"Gentlemen,—I am glad to be able to place before you the survey plans for the proposed ropeway which as far as my information goes at the moment presents no engineering difficulties. The cost of the survey has certainly been more than we anticipated, but this was chiefly due to the

monsoon bursting earlier than usual, which necessitated Mr. Ledger abandoning the work and having to come back and finish it later.

A statement of the accounts to date I have laid on the table. At a meeting of the Motor Transport Syndicate held in Mundakayam on Saturday last it was decided to amalgamate the flotation of the Peermade Ropeway and the New Motor Transport Company provided the Ropeway scheme showed the promise of good working returns and the Peermade estates interested agreed to subscribe to the scheme at the rate of £1 per cultivated acre.

This I think is quite assured as I have the working costs from two engineering firms and for safety's sake have taken the maximum working cost figures including all depreciation calculating depreciation on the rope itself which is the chief item at 50% per annum and the cost comes out at less than our present cart rates.

The present transport returns show about 4,000 per month and as you know this only represents a small portion of the rice supply of the district and a very small item for manure both of which will be more than doubled if we had reliable transport arrangements to the West Coast.

The highest figures quoted to me are from 30 to 60 cents per ton mile and taking the highest cost and the minimum traffic figures of 400 tons per month and allowing a 10% dividend on a capital outlay of £10,000 which I think is a very high figure for the Ropeway a charge of 6/8 per ton would be necessary.

Taking cart hires from Peermade to Mundakayam at Rs.9 per cart, return load, which is a low average, and calculating 3⅓ carts per ton it works out for a ton each way	Rs...	30	0	0
Ropeway and Motor Transport charges—				
From Estate to Ropeway return load per ton average	Rs...	5	0	0
Motor Lorry return on one ton each way ...	„ ...	17	0	0
Ropeway return on one ton each way ...	„ ...	6	8	0
	Rs...	28	8	0

This shows a saving of Rs.1-8 per ton on present charges calculating the cost on maximum figures and the minimum traffic returns which allows nothing for any Government transport on any other outside work which would be all extra profit.

The other firm estimated a lower rate of Rs.4-8 per ton calculating 50% depreciation per annum on the rope which I anticipate will be nearer the actual cost as in the above calculation I allowed a capital of £10,000 for the cost and erection of the ropeway which I consider a very outside figure.

Unfortunately I have not yet got estimates for the cost and erection but expect them any day now but on the face of the above figures which are given by firms who have had the survey and are estimating for the work I think that there is little doubt of the success of the scheme.

In fact it will pay the whole of Peermade including Vandiperiyar side to send their produce to the West Coast as we know the shipping charges are much less at Cochin and with the prospects of a harbour there of which there is more chance now, the eastern route and rail freights to Tuticorin can never compete with Cochin.

Government have agreed to acquire the land for the Ropeway and are prepared to further the scheme in every way.

From now onwards, if the scheme goes through, which I sincerely trust it will, things will move quickly and I want you to agree to a cess of £1 per cultivated acre towards the Company.

As soon as estimates are received if the Directors of the new Company are satisfied that the scheme is workable a prospectus will be issued and a certain amount will have to be called up at any early date.

If other estates besides the present ones who have at present agreed to come in the cess might be reduced but we must now be prepared to put down funds at an early date and further a scheme which is an absolute necessity for the welfare of the district."

Mr. Richardson now proposed that a Committee be appointed to go into working of this Ropeway and proposed that the Committee consist of Messrs. Leahy, Bissett, Richardson, Westaway and Roissier. Seconded by Mr. Forbes and carried unanimously.

Kothimatha Landing.—Mr. Richardson explained the scheme for the improvement of this landing and hoped that the cost of the survey of the land would be shared by Peermade and Mundakayam.

Lady Ampthill Nursing Institute.—Mr. Forbes said that in view of the great support given to this Institute by the Planting Associations and by Planters he proposed the following resolution :—

"That the Planting Member of Council should be a Member of the Lady Ampthill Nursing Institute Committee." Seconded by Mr. Bissett and carried unanimously.

Veterinary Hospital Peermade.—It was resolved that the Honorary Secretary do write and thank Government for sanctioning a Veterinary Hospital for Peermade.

Fitter Fund.—Mr. Leahy proposed a vote of thanks to Mr. Cantlay for all the work he has done for the Fitter Fund. Seconded by Mr. Richardson. Carried with applause.

Election of Office Bearers.—The following gentlemen were elected as office bearers for 1914 :—

Chairman	... ...	Mr. H. C. Westaway.
Vice-Chairman	... ...	Mr. W. H. G. Leahy.
Honorary Secretary	... ...	Mr. R P. Roissier.

Committee :—Messrs. T. C. Forbes and J. S. Wilkie.

Mr. Bissett said that before leaving the Chair he wished to thank the Committee for their help and also Mr. Roissier the Honorary Secretary for the manner in which he had assisted him in his work during the past year. —(Applause).

Mr. Richardson on behalf of this Association said that he wished to thank Mr. Bissett for the most able manner in which he had carried out the duties of Chairman for the past two years.—(Loud applause).

Mr. Bissett briefly thanked Mr. Richardson and the Members of the Association and declared the Meeting closed.

REGINALD P. ROISSIER,
Honorary Secretary.

The Anamalai Planters' Association

The Minutes of a Meeting of the General Committee held at the old Valparai Bungalow, at 2 p.m. on 30th January, 1914.

PRESENT.—Geo. L. Duncan (Chairman), E. W. Simcock, C. R. T. Congreve, A. A. Robb, G. A. Marsh and J. Hatton Robinson (Honorary Secretary). *Visitors*:—J. Harding Pascoe and J. E. Scott.

Township Scheme.—The Hon'ble Mr. E. F. Barber's letter of 15th January was read.

On the question of finding the money to commence felling operations coming up—Mr. Marsh very kindly said that he would lend any sum of money required up to Rs.1.500 without interest for 6 months. This amount was underwritten by the following:—

Messrs. Pascoe Rs.400, Congreve Rs.200, Robb Rs.200, Scott Rs.200, Duncan Rs.200, Robinson Rs.200, Marsh Rs.200.

The furthering of the Scheme was then left in the hands of the Sub-Committee elected to carry out the work.

2. *Labour Commission.*—Of the 9,751 acres subscribing to this Association 5,916 are giving definite support to the proposed Labour Commission —and 3,835 acres give their support on the same conditions as those proposed by Messrs. James Finlay & Co., so that this Association is prepared to *unanimously back the scheme*—should it be started *on the strong lines* recommended by the working Committee—Messrs. Abbott, Nicolls and Barber.

It was recorded: "That the Committee of this Association highly appreciate Messrs. James Finlay & Company's public spirited action in putting the whole of their Machinery at the disposal of the U.P.A.S.I. and trust that their action will be an incentive to those who have so far withheld their support to now come forward, and give the men who have worked so hard in the interests of the S. Indian planters the support they ask for and thereby make the Scheme an absolute success."

3. *International Rubber Exhibition.*—Mr. Richardson's and other letters in connection with the Exhibition were read. Owing to the small acreage under Rubber in the District it was decided that this Association was not in a position to support the movement.

4. *The formation of a Rubber Grower Association and the employment of a Scientific Officer in S. India.*—Read the Hony. Secretary of the Mundakayam Planters' Association letter of 17th December 1913. The meeting sympathised with the Scheme—but were not prepared to support the same.

5. *Postal Affairs.*—Read Mr. Barber's letter of 31/12/13 and the Director of Telegraphs letter No. 7153 of dated 19/12/13. Copy of Communication No. A. 3/10 dated 8/12/13 from the Superintendent of Post Offices, Nilgiri Division, to the Postmaster-General, Madras.

The Collector of Coimbatore's letter No. 4597/Rev. of 1913. The Superintendent of Post Offices, Nilgiri Division letter No. 15355/H 2-2 of 25/12/13/ and the Hony. Secretary, A. P. A's reply to same. Mr. Duncan's letter of 5th January 1914.

The Director of Telegraphs letter No. 7655 of 12th January 1914.

The Hony. Secretary was instructed to write to the Director of Telegraphs and say that the Department could commence putting up the posts and wire as far as the new Township site as the building for a combined office on this site would be ready by the time the wire was up to the District.

It was decided that no other temporary office be erected and that the present office remains at Valparai until the permanent new office is built.

6. *Weights and Measures.*—My Aylmer Ff. Martin's representation was quite approved of.

J. HATTON ROBINSON, *Hony. Secy., S. P. A.*

CORRESPONDENCE.

Peravanthanam Estate,
Mundakayam, S. India,
3/2/14.

Tea.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—Mr. Phil Beaver's figures of yield from young tea interested me and I give my own figures in return. I planted a 67 acre block in July —August, 1910, with small plants from seed laid down in December, 1909. The clearing is very rocky, and even last year 1913, I had to put in 18% of vacancies.

I started tipping in November, 1912, and give my yields since that month :—

1912	November	...	872 lbs.
,,	December	...	2,206 ,,
1913	January	...	1,426 ,,
,,	February	...	1,906 ,,
,,	March	...	3,766 ,,
,,	April	...	4,916 ,,
,,	May	...	4,957 ,,
,,	June	...	3,809 ,,
,,	July	...	3,080 ,,
,,	August	...	2.808 ,,
,,	September	...	3,586 ,,
,,	October	...	5,171 ,,
,,	November	...	3,790 ,,
,,	December	...	4,732 ,,
		Total...	47.025 lbs.

G. L.

The actual Made tea figures are exactly 25% of the Green Leaf, so this works out to 175 lbs. of Made tea per acre, when the clearing was 3 years and 5 months from planting. My rainfall is about 180 inches and elevation 1.200 feet. This is a very poor yield for this District and if some young Peermade places would give their figures they might give some record yields, well over 300 lbs.

Yours faithfully,
H. B. KIRK.

Tea Yields.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—It would interest Tea planters more if Mr. Beaver would give a few particulars regarding the wonderful growth of the 50 acre block he writes about ; and perhaps he would answer the following questions :—

What age were the plants when he topped them down ?

To what height were they allowed to grow before the topping was done ?

What height were they topped down to ?

The plucking of Tea bushes at 2 years old seems early, especially at an elevation of 5,000 feet ; and the spread of 4 to 5 feet over the whole block hardly credible. It must be a record.

Yours faithfully,
A. H. G.

THE KANAN DEVAN HILLS PRODUCE CO., LTD.

Labour Department.

Srivilliputhur P. O.,
5th Feb., 1914.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—It has already been pointed out in the Public Press that the proceedings of the Nilgiri Planters' Association were badly reported. Perhaps you may care to have the enclosed report amended by myself, of what I really did say on the occasion of that Meeting. I did not make any set speech, I only replied to a few questions raised.

Yours faithfully,
AYLMER MARTIN.

Mr. Martin, on being asked to reply to Mr. Robert Stanes, prefaced his remarks by saying he was glad to see so many old friends present and to make acquaintance of others who, he hoped, would also always be his friends.

They had heard the report of the Executive Committee appointed to go into the Labour Commission question. He preferred the term "Department" to "Commission" chiefly because the latter word should be avoided in connection with the recruiting coolies. It savoured too much of the professional recruiter. One of the things mentioned in the list of objects which the proposed department would do, was to give active assistance in recruiting coolies. One of its most important duties would be to see that the subscribing Estates would have an ample labour supply, in this respect putting things on a better labour footing. If any Estate wanted help in this direction, they could supply themselves with new connections of coolies with the active help of the Labour Department, and help would also be given to old Maistries to get coolies for whom they had received advances. If Estates were short of labour, the Department could help them in many ways. In the Districts of Anantapur, Cuddapah, Kurnool, Nellore, which they could see by the map on the wall before them, was included in the ground to be covered by the operations of the proposed Department, there was at first practically nothing to do but to get new labour. Only one small area there had been tapped by the Bababudins, and this area would of course be reserved for them.

One of the reasons for asking for so large a subscription as Rs.2 per acre was the necessity, Mr. Martin knew from past experience to have their business in the control and closely supervised by Europeans, and these must be the best they could possibly get. The work of the Indian Agents could then be effectively and closely checked.

. . . . . .

Later on Mr. Martin asked leave to add a few more words as he was anxious to scoop in Mr. Stanes and the Nilgiri Tea Planters' Company. We wanted to bring them in as an area of 3,000 acres could not be left out if possible. He wanted them to be with him, and he certainly did not want to be against them. He had heard Mr. James Stanes mention the word "tax," he personally preferred "insurance" or "investment." He pointed out that the 20,000 acres he had the honour to serve were controlled by business men, and therefore they expected to see a return for investment, and they would not have continued to put money into a Labour Department if they considered it unprofitable.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish a very interesting article on Nitrolim and Nitrate of Lime from the pen of the Scientific Officer which gives much useful information. Useful suggestions are given as to the transport and application of Nitrolim and Nitrate of Lime. The cost of the Nitrogen contained in both is carefully worked out.

In New Caledonia we note the Robusta variety of Coffee being more as immune from disease, is being planted in preference to Arabica which has suffered much from the ravages of Hemileia Vastatrix.

The minutes of the Annual General Meeting of the Mundakayam Planters' Association, which was well attended, are printed. They are interesting. The speeches of the Chairman and Mr. J. A. Richardson on the Labour Commission, though sound from their point of view, failed to convince the meeting of the necessity of supporting the proposed Labour Department, and it eventually decided not to send a delegate to the Bangalore meeting in March.

A letter from the Secretary to the Government of Madras is printed and should prove of interest to those interested in Cinchona cultivation. It is in reply to the Resolution passed at the last Annual Meeting and forwarded to Government for consideration. Carefully read, it does not give much, if any, encouragement to private enterprise in this industry. Though not absolutely definite in its refusal to comply with the request put forward in the Resolution, it is calculated to stifle any desire of the private person to undertake its extended cultivation under Government auspices.

We have the pleasure to publish a letter from Mr. J. A. Richardson, which supports the views of "Manager," published in a previous issue, and traverses Mr, Newcome's arguments against the establishment of a Labour Commission.

We reproduce an interesting article on Immigration into British Jamaica which seems to be a happy field of work for coolies who are well looked after. Since their advent, within eight years, the Export trade of Demerara has increased considerably.

Scientific Officer's Papers.

CXXVI —Nitrolim and Nitrate of Lime.

It would appear that a certain amount of confusion exists among planters as the differences between Nitrolim and Nitrate of Lime and this paper is an attempt to clear up this confusion.

While both are manufactured by electrical processes, the Nitrogen being obtained from the atmosphere, they are quite different substances. Nitrolim is a mixture of 45 to 59% of Calcium cyanamide, a body containing the elements Calcium, Nitrogen, and Carbon, with about 24% of free Lime, or Calcium oxide, the rest being chiefly Carbon, Silica, and oxides of Iron and Alumina. When added to the soil the Calcium cyanamide, which is the Nitrogen containing component for which the fertiliser is purchased, is split up under the influence of water and the soil bacteria, and the final result is the formation of Calcium carbonate and Nitrates, the latter supplying food to the plant.

This fertiliser is a basic one, supplying Nitrogen to the plant in a quickly available form as nitrate and at the same time a dressing of Lime which is so valuable on South Indian Soils which are as a rule deficient in this constituent.

Nitrate of Lime on the other hand is more or less a pure body containing about 77% of Calcium Nitrate which is similar in properties to other Nitrates, like Nitrate of Soda. It is very soluble in water and directly available to the plant. Like Nitrolim it is basic on account of the Calcium in it and thus has a great advantage over other mineral nitrogenous fertilisers like nitrate of soda and Sulphate of Ammonia which require the presence of Lime to make them fully available and efficient as manures. Nitrate of Lime does not drain so easily through the soil as Nitrate of Soda. This latter fertiliser rather tends to exhaust soils and spoils their physical condition by depriving them of the lime, which faults are prevented by using Nitrate of Lime.

Trials of these two fertilisers with Cereal and other crops in Europe have shown them to be of about equal efficiency, but trials are needed in India with crops like Coffee and Tea to test, not only their value, but their respective merits as fertilisers. These trials are all the more necessary since both could be manufactured in India if there was a proven demand for them on a large scale, there being abundant water power running to waste in this country.

With regard to price, Nitrolim is the cheaper and more economical. Nitrolim is guaranteed to contain 18% of Nitrogen ; a ton of it contains 403·2 lbs. of Nitrogen and costs Rs.200. Therefore a pound of Nitrogen bought as Nitrolim costs, in round figures, 8 annas. Nitrate of Lime is guaranteed to contain 13% of Nitrogen ; a ton of it contains 291·2 lbs. of Nitrogen and costs Rs.170. Therefore a pound of Nitrogen bought as Nitrate of Lime costs 9 annas 4 pies.

Both fertilisers present difficulties in their application. Nitrolim is in the form of a very fine dusty powder which silts through even double bags and it should, in consequence, always be transported to estates which are far from a railway in drums or tins. It should always be mixed with at least twice its weight of dry soil before application, spread as evenly as possible over the surface of the soil, and lightly dug or worked into a depth of three or four inches. It should not be applied on wet or windy days,

Nitrate of Lime has the disadvantage of being deliquescent, that is it rapidly absorbs moisture from the air and becomes pasty and finally liquid. This property renders it difficult to store, especially through a monsoon, and difficult to apply unless put out immediately after the packages are opened. Once applied to the soil, however, this deliquescent property is not a disadvantage, indeed probably an advantage.

In designing any experiments to test the relative advantages of these two fertilisers on any crop it must be remembered that one hundredweight of Nitrolim costing Rs.10, contain the same weight of Nitrogen as 155 lbs. of Nitrate of Lime costing Rs.11-12-3. Nitrate of Lime is a little more rapid in its action than Nitrolim and it may be that weight for weight it may be more efficient, but this needs demonstration. In fact experiments are needed to discover which is the more economic fertiliser to use with Coffee and Tea and how both compare with Nitrate of Soda which is a more expensive fertiliser. Nitrate of Soda is guaranteed to contain 16% of Nitrogen; a ton contains 358·4 lbs. and costs Rs.220. Therefore a pound of Nitrogen bought as Nitrate of Soda costs 9 annas 10 pies. In addition to this it has the disadvantage of removing Lime from the soil instead of adding it as Nitrolim and Nitrate of Lime do.

With regard to mixtures, a mixture of Nitrate of Lime with Superphosphate, should be applied as quickly as possible or chemical action takes place resulting in the insolubility of the Phosphate. A similar mixture of Superphosphate and Nitrolim is apt to generate heat and may need to be damped while mixing.

A mixture containing Nitrolim which has produced some fairly good results with Coffee consists of 5 parts of Basic Slag, 3 parts of Sulphate of Potash, and 4 parts of Nitrolim. At present prices this costs Rs.7-3 0 per cwt. It should be applied at the rate of 4 to 6 cwts. per acre, at a cost that is to say of Rs.28-12-0 to Rs.43-2-0 per acre.

RUDOLPH D. ANSTEAD,
Planting Expert.

Coffee in New Caledonia.

The quantity of coffee exported in 1912, which includes 34 tons from the New Hebrides, amounted to 404 tons, valued at £33,092. Since the year 1903 coffee exports have advanced steadily, the average yearly increase having been slightly over 71 tons. The quantity exported during the five years 1907-1911 averaged 454½ tons a year. In 1912, however, owing to the ravages of the coffee plant disease, known by the name *Hemileia vastatrix*, there was a decrease in the exports as compared with 1911. This disease, which made its appearance here towards the end of 1910, has done much damage, and in spite of all efforts to stop it is still spreading slowly. Some plantations have been completely, others as yet only partially destroyed, the timely spraying of the plants with *Bouillie Bordelaise* (a preparation containing sulphate of copper) having had the effect of checking, though not, as it had been hoped, of eradicating the disease. Many plantation owners are now discarding the *Arabica* for the *Robusta* variety, which offers greater resistance to the disease, whilst others, having lost all or most of their plants, are substituting cotton for coffee. The present area under coffee is estimated to be about 1,500 hectares (3,705 acres). The quality of New Caledonian coffee is very good. —*The Rubber World.*

DISTRICT PLANTERS' ASSOCIATIONS.

Mundakayam Planters' Association.

Minutes of the Annual General Meeting of the Mundakayam Planters' Association held at Boyce Bungalow, on Saturday, February 7th, 1914, at 10 a.m.

PRESENT.—Messrs. G. H. Danvers Davy (Chairman), R. Harley, (Vice-Chairman), H. J. Byrne, W. W. Birthill, E. R. Gudgeon, Ashton Hamond, Eric Hall, J. Y. M. Henderson, Ch. Hendry, H. B. Kirk, H. Lord. C. Martin, J. A. Richardson, A. W. Ruxton, George West, J. Wedderspoon, and Edwin Vincent (Honorary Secretary). *By proxy*: Messrs. J. J. Murphy, C. M. Hunnybun and F. A. W. Meumann.

The Minutes of the last meeting were taken as read and confirmed.

1. *The Honorary Secretary's Report*—The Hon. Secretary said :—

" Mr. Chairman, Gentlemen,—I have the honour to present my report for the year 1913. The acreage under cultivation in the District at the end of the year was 11,928'15 acres under Rubber, 708'18 acres under Tea and 45 acres Tea and Rubber interplanted, making a grand total of 12,681'33 acres. This represents an increase of 188 acres on the figures for 1912, but the 1913 clearings actually amount to more than this, the difference being explained by the fact that resurveys have resulted, in some cases, in a decreased acreage on the figures previously given. The Native openings have, in the District, increased by some 225 acres so that at the close of 1913 these holdings amounted to nearly 2,000 acres under Rubber. With regard to crop figures, the out-put in 1912 amounted in round figures to 360,000 lbs. Rubber and 730 lbs. Tea ; the figures last year amounted to the very respectable total of 713,500 lbs. Rubber and 12,109 lbs. Tea, an increase of 353,500 lbs. Rubber and 11,379 lbs. Tea, over the previous year.

Some Estates in the District have kindly furnished me with figures of crop per acre and per tree in 1913. The best returns made are 260 lbs. per acre and 1'50 per tree for 1906 planting but the best record all over is 198 lbs. per acre and 1'14 per tree over a whole estate, for 1906 and 1907 planting. The strength of the Association is 17 Estates with a membership of 43 at the close of 1913.

Subscriptions for 1913 are all in and the only outstandings are private subscriptions to the Planters' Benevolent Fund. This Fund, I am glad to say, has progressed more favourably during the past year than hitherto. A statement showing the amounts subscribed locally since the inception of the Scheme, is on the table and will be printed and circulated to members together with the minutes of this meeting.

The accounts have again been audited by Mr. H. B. Kirk to whom the thanks of the Association are due. The Balance Sheet is being printed and will be circulated in due course.

During the year there have been four General Meetings and eight Committee Meetings and the average attendance must be a source of satisfaction to the Officials of the Associaton.

With regard to the year's Secretarial work, some of the grievances mentioned in my last report have been removed and some have not. The bridge on the Lalam-Poonjar Road is now complete and Government have

sanctioned estimates for the repair of the Kanjirappalli-Erathupetta Road. I am sorry to say we have not been able to get Mr. Ahser's Telegraph Office at Erathupetta put through.

Post Office.—This subject was also in my last year's report. The delay in delivery of parcels have been lessened considerably but still remains. Recently we have had a visit from the British Resident (Mr. A. T Forbes) who cordially received the Committee of the Association and discussed Post Office matters.

Representations to Government by Mr. J. J. Murphy have resulted in an Anchal box being placed at the 35th mile.

Roads.—This is one of the subjects to be brought up at the next Sri Mulam Assembly on 19th inst. Allied with it are, the question of Bandy Shelters and the Regulation of Traffic on the Kottayam-Kumili Road. I am pleased to say that His Highness' Government have sanctioned large grants for the repair and upkeep of this road, and our appreciation of Government's action in the matter has been recorded. As before mentioned, however, there remains much to be done in the matter of Traffic regulation, but I can get no reply from Government on this subject.

Government have been asked to support Mr. Atkins' bridge and cart road connecting Mundakayam with R ni and I hope to get information, as to this, very shortly.

I have endeavoured to gain some idea as to the amount of Traffic passing through the Kanjirappali Toll Gate but have not succeeded in eliciting a reply from the clerk in charge.

Grazing Lands.—This important subject will also be brought forward at the Sri Mulam Popular Assembly. My letters to Government on the matter and also with regard to the erection of a Cattle Pound in Mundakayam remain unanswered, although, in the latter case, the Association has offered to erect the Pound at its own expense.

Freight Rates.—Some attention was given last year to this matter. The rates from Penang, Port Swettenham or Singapore, have been reduced from Rs.75 to Rs.65 and coast rates have consequently gone down from Rs.65 to Rs.60 per ton.

The Scientific Officer Scheme.—Last year I announced that the Scheme approached completion but since then several Estates have withdrawn and we have had to drop the idea of employing a Scientific Assistant of our own. In November we received a visit from Mr. R. D. Anstead who made the suggestion to us that we should form a Rubber Growers' Association in South India. This idea met with approval and Secretaries of other South Indian Associations interested in Rubber have been written to. At the next meetings of these Associations the question will be discussed and much may come of it. The Travancore Government was asked if there was any possibility of the establishment of a Scientific Officer on the State Experimental Plot at Malayatoor but replied in the negative. The Government however, has in their service an Officer trained in Agriculture whose professional advice is available to the Planting Community.

Finance.—The question of disposing of Rs.2,500 surplus funds of the Association, resulted in that sum being voted towards the erection of a Planters' Hall. From this a Scheme has arisen about which Mr. Kirk will speak to you later on at this meeting.

Labour Commission.—In August last we were very ably represented at Bangalore by Mr. Ashton Hamond. The outstanding feature of the meeting was the question of establishing a Labour Commiseion. Those of you who have read the *Planters' Chronicle* will know the position at present. Locally

only one Estate representing 1,023 acres has definitely joined the Commission. The subject is on the Agenda at this Meeting, and the Chairman will also, no doubt, have something to say on the matter.

Hours of Attendance at Outstations.—On Mr. Kirk's complaint Government was approached. The hours prescribed by Government are from 11 a.m, to 5 p.m. on all days except holidays, for all offices and courts in the State. During the year a criminal court with a 2nd Class Magistrate has been established in Mundakayam.

Koshy's Hotel.—My request for subscriptions to this did not meet with the support expected in view of the resolution passed at the November meeting. Unless we can raise the sum of Rs.600 immediately, I am afraid, the Manager of the Hotel will have to close.

Oil Fuel.—I am expecting a visit, shortly, from a representative of Messrs. Shaw, Wallace & Co., with a view to the establishment in Mundakayam of a Depôt for the supply of Liquid fuel.

Foot and Mouth Disease.—A serious outbreak occurred during the hot weather of 1913, and I immediately approached Government who directed the Director of Agriculture to take the matter in hand. A Veterinary Hospital has since been erected at Peermade and opened recently by Mr. J. A. Richardson. Our appreciation of Government's action in this matter is recorded.

Sri Mulam Popular Assembly.—In the past we have had only joint representation with Peermade but this year Government has sanctioned separate representation from Mundakayam.

In conclusion I wish to record my thanks to the Chairman and Committee for valuable help during the year and with this, Gentlemen, I place my resignation in your hands."

2. *Auditor's Report.*—The Auditor Mr. H. B. Kirk said :—

"Mr. Chairman and Gentlemen,—I audited the Association's accounts on January 28th and found them correct, and have signed the balance sheet with the Honorary Secretary. The Bank Reconciliation statement I have checked by the Pass Book.

The total amount of Rs.75 standing at the credit of the Hall-Fraser Memorial Fund will not be required, only Rs.30-1-8 having since been paid out, and the balance Rs.44-4-4 will be transferred back to the M.P.A. funds. This will make a total balance of Rs.2,569-14-7 standing at the credit of the Association Funds, against Rs.2,437-2-8 last year. The other items in the Balance Sheet are all correct. I again recommend that a full list of all subscribers to the Planters' Benevolent Fund in this Association be laid upon the table at the Annual General Meeting.

I find that our revenue in 1913 consisted of Rs.1,640 Estate Subscriptions and Rs.56 Bank interest. Total Rs.1,696.

Our expenditure was approximately Rs.1,612 which included a non-recurrent item of Rs.350 for a Typewriter, but it must also be noted that our U. P. A. subscription for last year was only Rs.487 owing to a large refund of London Rubber Exhibition Funds. This year I estimate our expenditure will be Rs.2,380 and the Honorary Secretary will supply details. I again have much pleasure in testifying to the neat and businesslike accounts kept by our Honorary Secretary."

3. *Chairman's Speech.*—Mr. G. H. Danvers Davy said :—

"Gentlemen,—Since our last General Meeting a great number of subjects of the greatest interest to your Association have been dealt with. Our Honorary Secretary has given us a thorough and most interesting résumé of

the work done by the Association, so I trust you will be lenient with me and forgive me if my report is short. Nothing serious has happened that I have heard of. I would now like to make a few remarks regarding our products of Rubber and Tea in our District. I trust you will admit they are both in a flourishing condition. Our prices for our Rubber have equalled those of Ceylon and the F. M. S. and crop figures per acre have been collected by our Honorary Secretary and prove very interesting indeed. A report of the Scientific Officer Committee was read at the meeting held on November 8th, 1913, and on this subject Mr. Anstead suggested that it would be a good thing for South India to have a combined Rubber Growers' Association and that this Association should obtain the services of a good man as Assistant to the proposed Mycologist in Bangalore. Our Honorary Secretary has written to the other Associations of South India asking for their support. You are all acquainted with the fact that there is to be a Rubber Exhibition in London this year. Is South India going to make a show? The Straits and Ceylon are sending in large exhibits and it is quite impossible to think that South India is not coming up to the scratch.

Another subject which I think is of the greatest importance to us, as a Planting Community, is the Labour Commission. This Association has given its views on the subject but I am of the opinion that we shall have to change our decision. I feel certain that the Labour Commission will, in the course of the next few months, be an accomplished fact; that we shall have to join it in self defence. I know well I am ploughing a lonely furrow but neither Ceylon nor the Straits will leave a stone unturned and the sooner we get our house in order the better for us. At present the outlook, as regards our Labour Force, is very rosy, but I fear what may be in store for us in the future. Let us accept, in the best of spirits, the old adage, "There is safety in numbers." As far as I can see the only reason against the Labour Commission is the sound reason that we have no law of Extradition in Travancore. I may be wrong; but this might be got over without accepting Act No. I by having our agreements written both in Travancore and in British Territory. Anyhow we cannot be worse off than we are now. I would press upon you the desirability of joining the Commission and, I trust, you all, who have the welfare of your Estate so much at heart, will reconsider your decision. In conclusion I thank you all for the support you have given me during the year. My thanks are, particularly, due to the members of the Committee and to Mr. Harley who acted as Chairman so ably in my place during my absence in England and to Mr. E. Vincent, as Honorary Secretary, for the excellent work he has done for the Association. In conclusion, Gentlemen, I have to thank you for the support you have given me as your Chairman during the past year and now beg to place my resignation in your hands."

4. *Election of Office Bearers for* 1914.—The Election of Office Bearers for 1914 resulted as follows;—

Chairman ... ... Mr. H. B. Kirk.
Vice-Chairman ... ... Mr. J. R. Vincent.
Honorary Secretary ... ... Mr. Edwin. Vincent.
General Committee:—Messrs. R. Harley, J. J. Murphy, G. H. Danvers Davy, Eric Hall and W. A. Asher.

5. *The Kodimatha Landing Stage.*—Mr. Richardson pointed out the inconvenience suffered under the present system at Kottayam, and said he had surveyed the land for a suitable site which would meet the requirements of the Planting Community in every way. He also said that the

subject would be brought up at the next Sri Mulam Popular Assembly by the Peermade Delegate and proposed : "That the Mundakayam Delegate to the next Sri Mulam Assembly support the Peermade Delegate in his application to Government in this matter." This was seconded by Mr. Ashton Hamond and carried unanimously.

6. Mr. Harley proposed : "That in view of the high charges made by the Kottayam Hundi Merchants for changing cheques, that the Honorary Secretary be requested to invite one of the recognised Banks to open a Branch at Kottayam for purposes of General Business, or failing this that one of the Kottayam Agents be supported by the District as our Recognised Hundi."

Mr. Ashton Hamond suggested that we might get a Hundi established in Mundakayam. The meeting then went into Committee and after some discussion Mr. Harley's original proposal was seconded by Mr. H. B. Kirk and carried, the seconder suggesting that we should also approach the Motor Transport Company.

7. (*a*) *Subscription to Local Association.*—The Honorary Secretary read the recommendation of the Committee that this be increased from 10 cents to 3 annas per acre. Messrs. H. J. Byrne and H. Lord objected to the appropriation of Rs.2,500 Association's Fund, for the Planters' Hall thus causing an increase in local cess. The Chairman pointed out that the increase in local subscription was necessary to meet the enhanced cess to the U. P. A. S. I. as promised by our Delegate at the last Bangalore Meeting. On being put to the vote the recommendation of the Committee was passed by 57 votes to 51.

(*b*) *The Election of a private member.*—The election of Mr. John Irvine as a private member was confirmed.

8. *The Labour Commission.*—Mr. Richardson said :

"Gentlemen,—I do not know that I can add much to what I have already said on the Labour Commission Scheme.

Since our last meeting the Executive Committee have met at Ootacamund and you will all have seen the result of that meeting. It is most encouraging to find that the Kanan Devan Hills Coy. has decided to join in the Scheme and hand over their entire Labour recruiting system to the new Commission on certain conditions.

The cost I know seems high, more especially to a District like this which is well supplied with Labour at present but as was pointed out at our last meeting the expenditure must be looked on as an insurance for the future and I am quite convinced that the time will come here, as it has elsewhere, under as favourable circumstances to start with, when we will require help.

I don't believe anyone, present, in his inmost mind believes that the present happy state of affairs is going to continue *ad lib.*

It is simply our selfish way of looking at things which, I am sorry to say, is becoming proverbial of the South Indian Planter.

They look at nothing beyond the narrow limits of their Estate or District "sufficient unto the day is the evil thereof" is our motto, "live for the present and let our successors look to the future," our line of action.

All I can say is if any of us have to retire in the near future and possibly join the boards of home Companies with a view to enjoying a well earned rest we will have a sorry time. By that time our shareholders will have awakened to the fact that labour means everything to the Planting Industry, that in many cases large amounts standing in the books in the name of

advances are not worth the pen and ink they are written with and we as the Managers of the time will be held responsible and I think justly so if we refuse to support the Labour Commission of Southern India.

If we refuse it can only be from selfish motives. If our Association was made up of a large number of Private Proprietors I would not be so surprised, but with Companies responsible for other people's money it seems to me we are taking a very heavy responsibility on our shoulders without sufficiently weighing the results.

I speak not only as a Manager but as one who has a large stake in the Planting Industry of Southern India.

'I would propose that this Association put the matter once more before the Proprietors and Directors of Companies and impress on them the necessity of carefully considering the question of joining the Labour Commission Scheme. That although at the present moment labour is plentiful the expenditure must be looked on as an insurance for the future."

In conclusion, gentlemen, I would ask you to weigh the matter carefully and appoint one if not two Delegates to attend the meeting in Bangalore and keep your Proprietors posted in what has taken place."

The Chairman supporting Mr. Richardson said he thought that local planters would have to reconsider their decision. The meeting then went into Committee but after some discussion Mr. Richardson's proposal met with no support and it was decided that to send a Delegate to the Bangalore meeting on March 4th was unnecessary.

9 & 10. Mr. Kirk read reports of the Hall-Fraser Memorial Fund, which is now closed, and of the Mundakayam Library. The Memorial Fund accounts were handed over to the Honorary Secretary and Messrs. W. J. Milner, R. Ellis (Peermade) with Messrs C. Martin and R. C. Milbank (Mundakayam) were elected as Library Committee for 1914.

11. *Planters' Hall.*—Mr. Kirk reported progress and said that the money promised by local subscribers and Companies was sufficient to warrant proceeding with the building on Mr. Harley's plan. The original Building Committee was elected to proceed with the work, Mr. R. C. Milbank filling the vacancy caused by Mr. B. M. Behr, who has left the District.

12. *Correspondence.*—The Chairman said that having fully dealt with all the subjects of importance to the Association in the Annual reports he did not propose to read any correspondence.

At this juncture Mr. Kirk took the Chair and after expressing his appreciation of the honour the Association had done him in electing him as Chairman for the ensuing year, proposed a vote of thanks to the retiring Chairman and to Mr. R. Harley who acted in Mr. Davy's absence, and to the Honorary Secretary, which were carried.

13. The next meeting will take place on May 2nd, 1914, and it was announced that Mr. J. J. Murphy would be glad to meet the members at his Bungalow on that day.

It was decided to invite Mr. S. C. H. Robinson and Mr. Alex. Slater to become Honorary members of the Association.

The meeting then terminated with a vote of thanks to Mr. Eric Hall for his hospitality.

H. B. KIRK, *Chairman.*

EDWIN VINCENT, *Hony. Secy.*

REVENUE DEPARTMENT.

Press—G. O. No. 327. Dated 2nd February, 1914.

Read the following papers:—

Letter from the Secretary, United Planters' Association of Southern India, dated 11th September, 1913.

ORDER.—With the letter first read above the Secretary to the United Planters' Association of Southern India communicates to Government a resolution of the Association asking Government to encourage planters to cultivate cinchona by the guarantee of a minimum price combined with control by Government of the acreage to be planted each year.

2. This suggestion has received full consideration by Government who have resolved that at present it is not expedient to enter into a definite agreement to buy bark from the planters for a fixed term of years. Whether such an agreement should be entered into hereafter will depend to a large extent upon the result of the further enquiries which His Excellency the Governor in Council proposes to make as to the cost to Government of growing cinchona on their own estates and as to the acres available for the extension of such estates.

3. It is not in contemplation to make any large extension of the Government plantations immediately as it is considered advisable to defer consideration of the question of making such extensions until a Director has been appointed and has gained some experience of local needs and conditions. Meanwhile, however, the opening up of new acres of Government cinchona will continue on a moderate scale in accordance with the principle laid down in G. O. Mis. No. 191—Revenue dated 23rd January, 1909, whereunder an additional area of 50 to 100 acres should be brought under cinchona every year.

4. Under G. O. No. 460—Revenue, dated 22nd May, 1906, the Government buy bark from private growers at the following rates:—

Bark analysing from	2½ to 4 per cent	... The London unit rate	
,, ,,	from above 4 to 5 per cent	... 1·05 of	do.
,, ,,	,, ,, 5 to 6 per cent	... 1·075 of	do.
,, ,,	,, ,, 6 per cent	... 1·1 of	do.

There is reason to apprehend a large rise in London unit rate as a consequence of the recent Java Combine and the Government therefore consider that the price to be paid hereafter to private growers should be a matter of negotiation before purchase, with the London rate as a maximum. Consequently the Director should in future before buying negotiate as to, and inform Government of, the price to be paid. The proportionate enhancements upon the price of the 2½ to 4 per cent. bark in respect of richer barks may be continued. As to the amount which Government will for the present buy annually from private growers, His Excellency the Governor in Council cannot make any definite statement. As a general rule purchase of not less than 300,000 lbs. of bark annually may be expected but, if the price at which the bark is available is very high, the Government may in any year find it inexpedient to make any purchase.

(True Extract.)

A. BUTTERWORTH,
Ag. Secy. to the Govt.

To The Secretary, U. P. A. S. I.
The Director, Government Cinchona Plantations.
Forwarded to the Secretary, U. P. A. S. I.

(By Order.)

(Signed) ....
Registrar.

CORRESPONDENCE.

Peermade, South India,
8th February, 1914

Labour Commission.

THE EDITOR,

The Planters' Chronicle.

Bangalore.

Dear Sir, I have read Manager's letter in your last issue with interest and like him am quite unable to follow Mr. Newcome's arguments especially when he talks of Managers of Companies playing ducks and drakes with other people's money *i.e.*, the confiding public.

My ideas on this point are just the opposite from Mr. Newcome's. I drew attention to this particular point in my remarks at the meeting of the Mandakayam Association yesterday and as the minutes may not be published for soms little time I enclose a copy of my speech as I think this is a point that wants airing.

To my mind the private Proprietor who has owned an estate for years and even though he be an absentee has a certain amount of personal influence himself (and possibly enhanced through having had the same manager for years) with his labour is the lucky exception who may be able to save the expense of the Labour Commission for a time, but the manager of a Company responsible for other people's money takes a very great responsibility on his shoulders if he does not join the scheme.

Yours faithfully,

A. J. RICHARDSON,

F. M. S. EXPORTS.

According to information cabled by the Federated Malay States Government to the Malay States Information Agency, the exports of plantation rubber from the Federated Malay States for the month of December amounted to 5,859,840 lb. as compared with 4,618,880 lb. in November and 3,693,929 lb. in the corresponding month of 1912.

Appended are the comparative statistics for the last three years :—

	1911.	1912.	1913.
January ...	1,329,170	2,730,576	4,772,880
February ...	1,490,849	2,715,767	3,936,529
March ...	1,916,219	3,089,583	3,890,880
April ...	1,235,917	2,285,390	3,642,240
May ...	1,147,488	2,255,034	2,744,000
June ...	1,229,754	2,305,915	4,491,200
July ...	1,581,993	2,695,861	3,989,440
August ...	1,651,845	3,655,535	5,293,120
September ...	1,677,062	2,968,121	4,480,000
October ...	2,182,857	3,215,231	4,838,400
November ...	2,104,317	3,121,473	4,618,880
December ...	2,147,859	3,693,929	5,859,840
Total...	19,695,330	34,732,415	52,557,409

It will be seen that the total export amounted to 52,557,409 lbs. (23,463 tons), as compared with 34,732,415 lbs. (15,506 tons) in 1912 and 19,695,330 lbs. (8,792 tons) in 1911.—*The India-Rubber Journal.*

IMMIGRATION

Indian Immigration into British Guiana.

The Methods Adopted.

It is interesting at a time when Indian Immigration is occupying the Imperial mind to such an important degree to turn for a moment to the experience of British Guiana in the matter of Indian Immigration, where, imported on the abolition of slavery, the cooly has proved a most potent factor in the well-being of our South American Colony. Indian Immigration opened in 1844, and has continued under the indenture system to the benefit of both Colony and cooly. Under the existing law male immigrants are indentured for five years and female for three, the latter remaining two years longer on the estates as free labourers. At the end of ten years they are entitled to a return passage on payment of half-fare in the case of males, and one-third in that of females. The system to-day is based on the Ordinance of 1891 and it is said that many years' experience has justified the principle of indentured immigration, and indeed, evoked eulogies on its results. The majority of estates import coolies, and the number brought in has averaged 3,500 yearly, though in recent times the average has fallen to 2,200. The orders are executed in Calcutta by an Emigration Agent appointed by the Colonial Office, who resides at Calcutta, coolies being obtained from upcountry places such at Patna, Mussaffarpur, Cawnpore and Allahabad. Regulations provide most effectively against deception by the sub-agents, while stringent medical inspection is also carried out. On arrival in Britiah Guiana the labourer is received at the Immigration Depôt, where he is housed and fed, pending allotmeht to an estate. The salaries of this Department, including the Agent in India, amount to about £6,800 a year and are paid from the general revenue of the Colony. Proceeding to an estate the cooly finds himself provided with a house and medical attendance. Malaria, bronchitis and dysentery are the diseases most common among the labourers, but these show marked diminution. Rations are provided to immigrants for the first three months of their indenture, a deduction being made from the wages of the adult. The employer is bound to provide regular work for all days except Sundays and authorised holidays, and to pay wages regularly every week. If work is not available on working days, the wages still have to be paid, and the minimum daily wage for time work is one shilling for a working day of seven hours. Work is, however, for the most part by the task, and the payment must not be less than a shilling, the task being capable of performance within seven hours. The average weekly wage earned during 1911 was 4*s*. 10*d*. The immigrant for his part must remain on the estate, and must discharge his allotted task. Failure in this regard entails legal penalties. The present number of East Indian in British Guiana is about 127,000 and some 9,000 are under indenture. No less than 38,000 free coolies are resident on the estates which is a tribute as to the satisfactory conditions under which they are worked and housed. They are, of course, encouraged to remain by means of free housing, and grants of small plots of land for rice cultivation and cattle grazing. With regard to rice the cooly has achieved wonders. At one time Demerara imported practically all her rice. That importation has almost ceased, and in its place there has developed within eight years an export trade which has increased from £60 to £60,000. The property acquired by the coolies is valued at £200,000, and their deposits in the Savings Banks amount to nearly £120,000. As might be expected the advent of the East Indian has not been entirely welcome to the negro, but the latter, though far better physically, is very uncertain in his habits, and can never be relied upon to be at work. Labour is still needed, but a pressing need at the present time is that of capital, without which the great Hinterland can never be opened up to civilisation.—*Ceylon Observer.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The proceedings of a well attended Special General Meeting of the South Mysore Planters' Association are printed. The Chairman's speech is of special interest at this moment. The question of extradition raises its head once again, but we think this is a doubtful benefit compared to what will accrue from the establishment of a Labour Department. This Association is one of the oldest, if not the oldest institution of its kind in India, and will celebrate its jubilee on the 16th and 17th March, for which invitations and inviting programmes have been issued. We wish them a continued long life of usefulness and prosperity.

The Scientific Officer and Doctor Coleman attended a meeting in South Coorg at which an interesting discussion took place on the question of Green Bug and other matters of agricultural interest.

The Ceylon Planters' Association held their sixtieth Annual Meeting and we reproduce some extracts from the Chairman's interesting speech, bearing on the Coast Agency and the Proprietors' Labour Federation. The former shows continued activity and 3,639 more coolies went over to Ceylon in 1913, than they did in 1912. The summary of the reasons for establishing a Proprietors' Federation should be read carefully, and compared with the extract on the same subject from the *India Rubber Journal*. They all have a bearing on our own Labour Question.

We conclude the Review of the Year on Rubber from the *India Rubber World*. Labour conditions are touched on, and the para. on undue publicity one that most will agree with.

We publish an interesting letter on Tea Yields from Mr. Beaver, and hope that the columns of this paper will be more freely used.

We have received by the courtesy of Mr. Aylmer Martin copies of advertisements issued by him from his head office both in English and vernacular, with photographs.

The uses of advertisement are brought to great perfection and are most explanatory of his methods. They can be seen at this office.

The Special Meeting will take place at these offices on March 11th, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

South Mysore Planters' Association.

Minutes of the Special General Meeting held at the Saklaspur Travellers' Bungalow, on Sunday, February 15th, 1914.

PRESENT.—Messrs. W. L. Crawford, J. G. H. Crawford, J. G. Hamilton, F. M. Hamilton, C. Lake, C. J. Hayward, A. L. Hill, D. Jackson, St. John Hunt, A. Thomson, E. W. Rutherford, C. K. Pittock, W. F. Scholfield, S. Sladden, Thiselton Anderson, Graham Anderson, C. I. E., Captain E. C. Foster, G. N. Frattini, Assistant Scientific Officer, and M. J. Woodbridge, (Hony Secretary). *Visitors.*—Messrs. Galiffe and Dixon.

Labour Commission Committee Report.—Mr. W. L. Crawford (Chairman) opened the proceedings with the following address :—

"Gentlemen.—This special general meeting of the Association has been called as you are aware mainly to discuss the Labour question and go into the details of the proposed Labour Commission. This most important matter your executive thought should be thoroughly gone into and definite promises of support obtained before the 50th Annual General Meeting of this Association to be held in Saklaspur a month hence.

"Every Planter in Mysore has of late noticed the increasing difficulty there is in obtaining suitable labour for Estate work and this want of labour is even more acutely felt in other Planting Districts.

"At the last meeting of the U. P. A. S. I. in Bangalore it was resolved to appoint a Committee to formulate a workable scheme acceptable to the whole of the Planting Associations of Southern India and since then we have been placed in possession of the Executive Committee's report, which I feel sure you have all studied and are unanimously agreed, that if what is therein suggested is carried out under a well managed organization very many of our labour difficulties will disappear,

"Personally I am entirely in agreement with the introduction of the Labour Commission upon the suggested lines of the Labour Commission, but from a Coffee Planter's point of view I think we are entitled to some preferential treatment as regards the amount of our subscription per acre. I admit the difficulty of the matter and I cannot do better than repeat what I have already said on the subject, *i. e.*, the proposed Labour Commission has almost everything in its favour and except the heavy cost nothing against it. The question of cost is, of course, a vital one, but if we are to have a Labour Commission and derive all the benefit we hope from its successful working, it will not be done at one rupee per acre unless the whole planted area comes in, and it must not be forgotten that anything that is really good and worth having costs money. To try to run a Labour Commission for Southern India on very cheap lines is to foredoom the whole scheme to failure. We must have the services of the very best men available for the work of organization and inspection, and a thoroughly good subordinate staff, and I fear we cannot hope to get either one or the other without paying fairly highly for it. If we all put our Estates on the Commission there will be every prospect of the scheme materializing into a most useful department.

"That we are urgently in need of such an organization to look after our interests is on all sides admitted, but the proposed cost of two rupees per acre may cause some to hold back, not that, they object to pay a cess of the kind but because they object to pay what they consider to be relatively more than their share.

"The Honourable Mr. Barber is reported to have stated: 'It has been suggested that the Coffee planter since he employs less labour and since his returns are smaller should pay a smaller contribution for salvation than his brothers in tea or rubber. It is equally true then, that he can less afford to pay increased rates of pay and large advances than the rubber or tea man and therefore his need for salvation is greater.'

"I am not quite in agreement with this view of the matter because in joining the Labour Commission we are all asked to pay for services to be rendered to one or other of our industries, no more and no less. If this is so I hold the Coffee Planter is due some concession in the matter of subscription not because his returns per acre are less than that derived from tea or rubber, nor because he can less afford to pay increased rates of pay for his labour, or give larger advances, but solely and simply because he employs ½ to 1 cooly per acre as against 1 to 2 coolies per acre required by tea and rubber. It seems to me an elementary business proposition those who require the services of the Labour Commission to look after only half the number of coolies and maistries that the others require should receive some concession. I may be mistaken, but, it seems to me a tea planter with 200 acres requiring probably 8 maistries and 400 coolies advanced and supervised is likely to ask for more help from, and take up a larger share of the Labour Commissioner's time than a Coffee Planter with the same acreage but only employing half the number of maistries and coolies.

"That we are in a difficulty and need salvation I readily admit but I don't think we can hope even under the Labour Commission that because our returns per acre are less than our brothers' in tea and rubber we will be given, nor can we expect any special concessions regarding advances or rates of pay. That day is past and now the old economic law, the ability to pay the same rates of pay as others come in and will be the factor that will decide the matter, not the benevolence of the tea or rubber planter and I cannot imagine either one or other restricting his rates of pay or advances to suit the desires of those who may or may not be able to pay increasingly higher wages and advances. Now, gentlemen, we are face to face with the keenest competition we have ever had and we can, I feel sure, by joining the Commission in a measure, see that rates of pay go no higher and that advances are restricted to a reasonable figure.

"We can hope and expect the Commission to help us by preventing unfair advantages being taken, to assist us by giving detailed information about new maistries and coolies we wish to employ, and if necessary, give them their advances in their respective villages on our behalf. Keep advances and rates of pay from rising and possibly give us help in recruiting in fresh Districts and possibly some measure of preference in the recruiting areas nearest our Estates. If the Commission is able to do this for us I do not think we shall regret having joined nor the money we spend upon it."

There was a long discussion during which Mr. Graham Anderson, C.I.E., expressed his opinion that extradition from British Territory into Mysore was still the most important subject.

The following resolution proposed by Mr. C. Lake and seconded by Mr. F. M. Hamilton was then put and carried without opposition: Resolved "That this Association is in favour of the introduction of the Labour Commission into Southern India and to instruct our Delegates to the U. P. A. meeting to urge upon the meeting support our claims to the following suggestions and amendments:—(1) Preferential treatment in recruiting areas.

(2) Reduction of subscription on Coffee, (3) Limitation of advances." Messrs. C. Lake and C. J. Hayward were elected Delegates to attend the U. P. A. meeting on the 4th March in Bangalore.

Report of Dussera Delegates.—" Gentlemen,—As your representative at the Dussera last October I was instructed to urge on Government the necessity for the introduction of an Act into Mysore similar to the Madras Planters' Labour Act provided the reciprocity in the service of warrants between Mysore and British Territory was included in it. I was also asked to find out if there was any opposition to the introduction of this Act,

" In a private interview which Mr. Fowke and myself had with the Dewan we were informed that this was not a matter for discussion at the Representative Assembly but that it would be considered by the Legislative Council if representations were made by our District Associations.

" The Dewan said that previously we had refused the Act and therefore nothing had been done. He was now willing to re-open the subject and before the Act in any form was introduced it would be submitted to us for approval.

" With regard to opposition to the Act there appears to be none. I spoke to several of the Indian Planters both from North and South Mysore and they were all in favour of the Act being introduced subject to modifications, the chief of which seemed to be the reduction of the acreage of a Plantation coming under the Act from 10 acres to 5 to bring in the smaller holdings.

" An Indian representative from South Mysore asked in the Assembly for Extradition under Act 13 of 1859. We opposed this as it has already been refused us and asked that the Act I of 1903 should be introduced into Mysore and the Chickmaglur Native Planters' Association supported us. The Dewan replied that the matter was under consideration.

. . . . . .

. . . . . .

" These were the only subjects I received instructions about and I conclude by thanking you for the honour you did me in electing me as your representative."

(Signed) C. LAKE.

Report of Committee on Co-operative purchase of Manure:—Mr. Pittock addressed the meeting on behalf of the Committee and said that owing to the delay of members of the Association in replying to the Circular asking for figures, the Committee were unable to lay a detailed scheme before the meeting; but a considerable amount of work had been done and facts and figures collected which all went to prove that by ordering our manures in bulk a considerable saving would be effected.

Mr. Crawford also spoke in favour of co-operation in purchase of manures, and Mr. Frattini, Assistant Scientific Officer, answered several questions. A general discussion then took place and it was agreed that Messrs. Frattini, Pittock and Thiselton Anderson should continue the work of the Committee . . . . . .
It was decided that a trial order should be given and a promise to take a large amount was given by members present at the meeting.

Election of new members.—Messrs. Randolph, H. Morris, L. Newcome and A. L. Hill were duly elected members of the Association.

M. J. WOODBRIDGE, *Honorary Secretary*.

THE SCIENTIFIC OFFICER AND DR. COLEMAN IN COORG.

On 20th February a meeting of the planters of South Coorg was held in the Bamboo Club at Pollibetta to meet Dr. Coleman and Mr. Anstead. The latter who was in the chair introduced Dr. Coleman, explaining that at the request of the Coorg Planters' Association and the Resident, the Mysore Durbar had kindly allowed Dr. Coleman to pay a visit to the district, and that while he was particularly interested in the outbreak of Green Bug on the Coffee and the work which was being done in Lantana eradication, he was also anxious to see as much as possible of the varied agricultural industries of the district.

Dr. Coleman explained what organised steps were being taken by the Mysore Agricultural Department to protect the native coffee from Green Bug and to deal with that pest when it appeared and he laid particular emphasis on the fact that the whole-hearted co-operation of the whole planting community both native and European was needed to make the campaign a success. It was necessary for all European planters to do their share and faithfully carry out the recommendations of their Scientific Department or it could not be expected that the native would do so. In some cases he instanced the native coffee proprietors were just as keen to take care of their coffee and willing to adopt spraying and other methods of control as their European neighbours.

An interesting discussion took place dealing with the pest in all its aspects and Dr. Coleman and Mr. Anstead took part in this and endeavoured to make clear the relation of the Green Bug to climatic conditions, cultivation, and its parasitic insect enemies and the parasitic fungus which attacks it in the monsoon.

A few specimens were examined and other matters of agricultural interest touched upon and the meeting closed with a hearty vote of thanks to Dr. Coleman for the way in which he had explained matters and all the trouble he had taken, and the hope was expressed that the planters would have an opportunity of again welcoming him to the district on future occasions.

Dr. Coleman and Mr. Anstead left Pollibetta for the Sidapur district on 23rd February and arrived at Mercara on 25th.

CEYLON.

Rubber Exports.—The following statistics of the exports of rubber of domestic production from Ceylon during the month of October, and the ten months ended October, 1912 and 1913, have been extracted from the official returns issued by the Ceylon Government;—

To	Oct. 1912. lbs.	Oct. 1912. lbs.	Jan.-Oct. 1912. lbs.	Jan.Oct. 1913. lbs.
United Kingdom ...	779,208	1,461,175	6,270,449	10,870,074
United States ...	467,040	315,855	3,479,584	4,972,093
Other States ...	265,627	540,981	1,567,721	3,958,568
Total exports of rubber of domestic production.	1,511,875	2,318,011	11,317,754	19,800,735

—*Board of Trade Journal.*

PLANTERS' ASSOCIATION OF CEYLON.

Sixtieth Annual Meeting.

Extracted from the Chairman's Speech.

Coast Agency.

Your Committee is now satisfied that a thoroughly competent Staff is in charge of the Coast Agency in South India.

During the year the Ceylon Labour Commissioner put forward his views on the desirability of increasing the scope of the Commission by appointing more European Supervising Officers and this matter is still under consideration.

97,564 coolies were registered at the Agencies of the Commission during 1913, this being an increase of 3,639 over the figures of the previous year and the largest number yet dealt with since the inception of the Coast Agency.

From the Superintendent of the Ragama Camp we have received the statement of estate coolies passed through that Camp which is reproduced in tabular form under the heading Ragama Camp. It will be noticed what a very large proportion of the total number of emigrants now pass through the various Agencies of our Commission.

Proprietors' Labour Federation.

In 1910 it was felt that something had to be done to try and improve labour conditions, and to endeavour to stop the increase of debt throughout the labour force in the country, and to effect this, the Proprietors' Labour Federation was formed. This came into existence in January 1911, and it was hoped that sufficient support would be forthcoming to make its rules effective. The chief of these placed a limit on Advances for coolies moving from one estate to another. However, as time went on, only a little over 50 per cent. of the tea and rubber estates agreed to join, and it was felt that if something different were not proposed its objects would not be attained. In May 1913, a fresh appeal was made to all Proprietors asking them to join and subscribe to a new set of rules, and it is satisfactory to note that in response to this over 75 per cent. of the European owned tea and rubber estates in the Island joined and the new rules therefore came into operation on the 3rd October, 1913. In referring briefly to the salient points of the new rules it would perhaps be as well to make some reference to the reasons which have influenced the large majority of the Proprietors in favour of Federation.

These may be summarised as follows :—

(*a*) The importance of securing the greatest efficiency from the coolies now in Ceylon.

(*b*) The necessity for safeguarding both old and new coolies from the capacity of dishonest kanganies.

(*c*) The necessity for introducing certain measures whereby recruiting from India will be stimulated and Ceylon's good name so firmly established that we need fear no rivals.

The Federation compels every member to keep his coolies' accounts, to pay travelling expenses of all new coolies, to wipe off the debts of the dead, to pay a fee of Rs.25 for every locally recruited cooly who within the period of three years has been brought over from the Coast, and it forbids him to

pay more than the registered debt of any other locally recruited cooly. It is fully admitted that, after running for a few months, several improvements and modifications of the rules may be advisable and expedient and the P. L. F. Committee have this before them. There may be, in fact, there is sure to be, some difficulty to commence with ; but there can be no doubt the continued efforts of so strong a combination will result in an improvement in the condition of the labour force and will promote the best interest of the planting industry.—*Ceylon Observer.*

The Proprietors' Labour Federation.—This Federation of Ceylon estate proprietors has been revising its rules lately with the object of making them more acceptable to proprietors and more suitable to the objects of the Federation, which are: (1) To check the steady increase which has of late occurred in coast advances in connection with labour already imported into the island, and to bring about a gradual reduction of such advances with as little loss as possible, and (2) to encourage the recruiting of coolies from the coast of South India, and generally to protect the interests of members employing imported labour. A large number of estate proprietors refused to join the Federation for a long time, and an effort was then made to get 75 per cent. of the European-owned estates of the Island to join. This has resulted in over 80 per cent. of the estates joining the Federation, so that the success of the scheme is practically assured.

There are two or three important points in the regulations and the object in view, namely, reduction of coast advances, should be accomplished. When newly recruited are being brought over from the coast the amount to be advanced to them is not to exceed Rs.15 (or £1) per head, and all new coolies are to be landed on an estate free of charge to them, other than the cash advanced into their hands, provided they work for one year on the recruiting estate. There is also an important regulation to protect the importer of labour from the coast and to put a stop to one estate taking over another estate's coolies at a slight advance in cash to the coolies or kangani. This regulation states, any Federated estate taking a labourer from another federated estate within a period of three years from the date of the labourer's recruitment shall pay a fee of Rs.25 (£1 6*s*. 8*d*.) per head to the importing estate, such a fee to be a charge against the on-taking estate and in no circumstances to be charged to the labourer. Coolies' debts are to be carefully kept in the estate books, and a copy of the accounts of the labour force are to be sent to the Federation's office, and every transaction relating to the transfer of coolies by Federated estates is to be recorded in the office of the Federation. Further, by the 15th of each month, the Superintendent of a Federated estate must forward to the office a statement showing :—

(1). The number of coolies shown on his register on the last day of the preceding month.

(2). The number of registered coolies who have been paid off during the preceding month.

(3). The number of registered coolies who have died during the preceding month.

(4). The number of coolies who have been taken on to his register during the preceding month.

All these accounts and statements will necessarily mean more work in the estate office, but the extra work will be more than paid for by the improvement in the labour conditions. It is to be hoped that the Federation will succeed in solving some of the many labour problems the Ceylon planter has to face.—*The India Rubber Journal.*

RUBBER.

Review of the Year.

(Continued.)

Labour Conditions.

Great Britain, the United States, the Continent of Europe, and in fact most of the white countries, have had sufficient trouble in connection with labour during the year under review. There has been an effect on the production of manufactured articles in consequence of labour difficulties in the United States, but the troubles which have been experienced in this country and on the Continent of Europe have not had any very marked effect on the manufacturing side of the business. In the Middle East, however, labour matters have occupied the minds of planters in Ceylon, South India, Malaya, Sumatra and Java.

Ceylon, which as far as the writer can remember, has always had its labour troubles, has always been putting forward schemes for the betterment of labour, has again brought forward a comprehensive scheme in connection with labour federation. The necessary majority of planters in Ceylon for the working of the scheme was obtained, and while it is too early to forecast the result of the scheme which has been put into being, we can only hope that it will have some real effect in keeping down coast advances and competition among individual planters.

In Malaya the necessity of reducing wages is acknowledged, but the difficulties are such that, except in certain districts of Malacca the reduction of coolie wages appears at first blush practically impossible. The price for the raw product being so low means that if the daily rate cannot be reduced and losses on rice are to be continued the task per coolies per day must be increased. We look for such an effect rather than an actual reduction in the rate of coolie wages.

In Sumatra the cost of recruiting Javanese coolies has gone to a figure higher than it has ever reached before. The old cost of 90 guilders per coolie no longer obtains, and it is common experience to pay from 140 to 150 guilders per head for coolies now imported from Java. It is said that this large increase has been mainly due to the activities of certain American interests in the way of planting programmes.

In Java the labour is still in a very disorganised and unsatisfactory state. The difficulty in establishing a resident labour force is of more account in connection with rubber than it is with most other plantations. The tapping of rubber trees can only be improved by long continuous experience of that particular work; hence the necessity of establishing resident labour forces on Java rubber plantations. It seems to us a paradox that Java planters should be so slow to move in a matter which has been approved by their brother planters in Sumatra. The indentured Javanese labour in Sumatra has been proved to be exceedingly valuable, so much so that not a single planter in that territory would like to give up the system. We see no reason why the Government of Java should not arrange for contract labour on the lines adopted in Sumatra where the coolie is well protected as well as the employer. In this connection we are very glad to note that a Rubber Growers' Association has recently been formed in Holland, and we hope that it will make one of its first duties the consideration of labour conditions in the island of Java. There are many parts of Java where large numbers of coolies are unable to find work, they could, with advantage to themselves and the island, be usefully employed in other districts.

Plantation Shares.

We doubt whether there is a single holder of plantation shares who can review, with any sense of pleasure, his private portfolio as at the 1st of

January and the 31st December, 1913. For the majority of plantation companies there has been a gradual reduction in profit consequent in the fall of the price of plantation rubber. This has led to an enormous reduction in the market value of the respective shares. The majority of plantation companies, who in past years paid handsome dividends, have either greatly reduced the average of the past two years or paid no dividend at all. In some cases interim dividends have been paid, and final dividends passed. Some companies have, fortunately, maintained or increased their dividends. During certain periods of the year the rubber share market has been entirely demoralised, and it has been an easy matter to purchase shares yielding from 10 to 15 per cent, even for the present year. There are, however, one or two shares which have stood the slump well, and whose dividends have not only been maintained, but in some cases increased. The marketability of most plantation shares has been put to a very severe test, and we are of the opinion that there will never again be the gamble in plantation rubber shares that there was a couple of years ago. The value of plantation shares will soon be on a steady and reasonable level; real worth will be determined not by "bull" and "bear" tactics so much as profits, reserve, and dividends. In other words, rubber investments are about to get into their stride.

Publicity in Plantation Matters.

At a public meeting held some time ago we were responsible for the statement that plantation interests were beginning to pay a part of the penalty for over-publicity in the past. A Committee of the Rubber Growers' Association was appointed to make some recommendations on this subject. The recommendations were quite unanimous; there was a widespread feeling among directors of companies that in the past far too much publicity had been given to the details of estate costs and methods of management. We do not know of any plantation industry, other than tea, in which the whole world is told every detail in the history of the company. We cannot see how this publicity can possibly lead to an increase in the profits of the various companies. We really feel that it is prejudicial to their interests for plantation companies to go and tell a dealer that when he gives them 2*s.* 6*d.* for their rubber he is giving them 100 per cent. profit. After all, the success of plantation companies must be determined by the profits made and distributed, and we do not see how publicity with regard to increase in crops, costs of tapping, and so forth can help to swell the profit and loss account. There are, however, many difficulties which we fully recognise, the most serious being in connection with companies who have issued bearer warrants, and who do not know their shareholders. Furthermore, there is a danger which however, in our opinion, is exceedingly slight, and that is that the non-publication of details may be abused by directors who intend to deceive. Shareholders can, however, take steps to protect themselves by insisting upon all details being available for their inspection at the respective offices.

Estimate of Planted Acreages.

The following is our estimate of planted acreages in the Middle East as at the end of 1913:—

British Malaya and Native States	...	600,000 acres.
Ceylon and South India ...	...	270,000 ,,
Java	...	245,000 ,,
Sumatra and Borneo ...	...	260,000 ,,
Cochin China	...	32,000 ,,

In addition there are other small acreages planted with rubber trees in Samoa, Fiji, Papua, Seychelles, etc.

We do not consider it necessary (if it were possible) to give figures of planted acreage for Ceará in Africa or Hevea in Brazil, as we do not believe, with present prices, they can maintain or exceed past crops of wild rubber from these countries.

We publish below a letter received from a recognised authority on the Dutch East Indies with reference to the acreages under cultivation in Sumatra and Java.

A letter received from a recognised authority on the Dutch East Indies gives the acreage under rubber (owned by rubber companies) as follows:—

Sumatra	...	209,181 acres.
Java ...	...	161,068 „

This authority also calculates the acreage planted in rubber by tobacco companies in Sumatra and coffee estates in Java to be approximately:—

Sumatra	...	23,100 acres.
Java ...	...	74,084 „

The total area under rubber in Java and Sumatra would therefore appear to be:—

Sumatra	...	232,291 acres.
Java ...	...	235,125 „

But the figures, especially for rubber on tobacco and coffee estates, being only approximate ones, our authority thinks that a more accurate estimate for the area under rubber about the middle of 1913 would be:—

Sumatra	...	240,000 acres.
Java ...	...	245,000 „

The annual progression in planted acreages in Java and Sumatra since 1906 is shown in the following table:—

	Java. acres.	*Sumatra.* acres.
1906 ...	25,000	... 6,000
1907 ...	38,000	... 20,000
1908 ...	60,000	... 39,000
1909 ...	107,000	... 67,000
1910 ...	158,000	... 100,000
1911 ...	208,000	... 160,000
1912 ...	230,000	... 220,000
1913 ...	245,000	... 240,000

It will therefore be seen that while Ceylon has practically not increased its planted acreage under rubber during the last few years, Java and Sumatra have gone ahead and placed Ceylon fourth in point of acreage.—*The India-Rubber Journal.*

CORRESPONDENCE.

Sholarock Estate,
Katary P. O., Nilgiris,
21st February, 1914.

Tea Yields.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—When giving the yield of the 50 acre block, alluded to in my letter of 16-1-1914, I did so not only as a matter of general interest, but also to get other men *on the Nilgiris* and especially those who like myself have opened in tea to a fairly large extent, at the same time, to give their results. So far, that letter has not elicited any statistics of yields from this, or other parts of the Nilgiris, such as Nellacotta, &c., where rainfall, and conditions are perhaps superior to this locality for yield.

I welcome Mr. Kirk's letter which is most interesting reading showing as it does, that *young* tea with conditions of heavy rain and low elevations, can produce 300 lbs. and *over* of made tea per acre at a very tender age.

The "Law of Compensation," while giving smaller yields for much less rain, and at higher altitudes, gives on the other hand, *flavour*. Mr. Kirk's clearing at 3 years and 5 months of age, gave him 175 lbs. made tea per acre. My block at 3 years and 1 *month*, has given 162 lbs. Mine has therefore 4 months before it to come into line with his. At a *low* estimate, I will pluck quite 16,000 lbs. more leaf by the end of next April, which will bring my yield to 242 lbs. made tea per acre. I am fairly safe in saying this; but, I will certainly correct these figures when the time comes, if I get less.

With Mr. Kirk, I hope we may see some Peermade yields published. It's a pity the pages of the *Planters' Chronicle* are not more used by those interested, in friendly discussions, comparisons, &c., on planting matters. I am sure we can *all* receive, and give useful "tips" by interchange of ideas.

In reply to A. H. G. (who, by the way, reminds me of a notable disbelieving character in Holy Writ) I will take his queries in the order he places them:—

At 1 year of age, the plants then perhaps an average height of 18" were topped to 1 ft. to cause them to start bushing. The side branches all round were left severely alone and only the tops relieved of flush.

During Feby.-March 1913, the field was pruned down to 18" and from that time the growth has been extraordinarily vigorous; the same care in leaving all side shoots alone, strictly adhered to.

As the yield I gave may be put down to hard plucking, *and any kind of plucking*, it may be as well to mention, that with the exception of the 1st month's pluck viz,, 489 lbs., *the whole of the yield* was purchased by Mr. T. Brown, Manager of Glendale Estates. I am sure he will testify to the excellence of the leaf received, and the regret was mutual, when I had to stop supplying him *only because* I found a closer market—the same remarks apply to the 489 lbs. which was purchased by Mr. Hayne, of Halashana Estate.

It may further interest A. H. G. to say that for unavoidable reasons, I had to get seed from Ceylon, to save a year in planting. This seed when it germinated, looked very disappointing and most of the men who saw the plants, condemned the jât; but, as the bushes developed, I could not have wished for a more satisfactory sort—A dark strong hybrid, a splendid yielder (as it has proved itself) and practically free of diseases. Indeed I am more than sorry the *whole* area since planted is not the same jât.

It is *quite* true A. H. G. I wish you were here to see for yourself that the bushes average 4 feet across. I can show thousands 5 and 6 feet in diameter. Romance in these matters, in cold print, would be foolish, as any one might look in to verify statements! While on the subject of yields, and although it might be another shock to credulity, there is an estate on *these* Hills, rainfall 60 inches or less, elevation 6,000, where a field shaded fairly heavily with grevilleas, has been steadily increasing its yield till last year, when it gave 900 lbs. made tea per acre while the whole of the rest of the estate, absolutely *without* shade, gave less than half the above yield average per acre. Fact. . . . . "Shade for Tea" is a subject which might with advantage be discussed in the *Chronicle's* columns. Personally I am as keen on my shade in tea, as the tea itself, so much so, that I would not think of opening any land, unless it was barbed wired in *first*. An even, *quick get up of shade*, represents so many more inches of rain; to say nothing of the storage of humus, and last but *not* least, protection (in our parts anyhow, where we get no S. W. monsoon rain to speak of) from the S. West winds, which keep up *steadily* for over 3 months and cause flush to shut up like a book during June, July, August and September. Anyone wishing to be convinced of this should *live* on an estate (facing the S. West) during *these* months—however beautiful fields may look *now*, after a good N. E. Monsoon and during spring he will be disillusioned once the S. W. starts. With this *continual* gale, the ground gets literally parched, and if the tea plant in the opening has not been treated to a good decent pit, carefully filled in, but only put into a hole the size of a pint tumbler, as is so often done, the results are worse. Hence my warning note *re* necessity for shade. Unlike coffee, once tea is fairly well established on the land, it is *next to impossible* to get shade to grow; at the best it's sickly, poor growth. Planted *at the same time as the tea* the latter's roots cannot get the upperhand, but where there are sambur, the land *must* be made *proof* with barbed wire fencing. It's a hopeless struggle otherwise.

Yours faithfully,

PHIL. BEAVER.

NOTE ON INDIAN TEA INDUSTRY.

A note recently issued by the Indian Government on the production of tea in 1912, says Brooke, Bond & Co., Ltd., London, in a late tea circular, furnishes interesting information of the industry. The acreage under tea increased by 17,238 acres, there being 591,833 acres in 1912 as against 574,575 in 1911. The average yield per acre increased from 503·8 lbs. per acre in 1911 to 544·7 lbs. in 1912. Owing to immaturity and other causes 47,026 acres were not plucked, and of these 4,514 were abandoned. Perhaps the most satisfactory feature of the returns is the increased yield per acre, which shows what can be done when prices are high, even when labour is scarce. The report also sets at rest apprehensions that the area of production was not being extended, notwithstanding the commodity being so remunerative to capital.—*Simmons' Spice Mill.*

The Planters' Chronicle.

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(INCORPORATED.)

Contents.

Mr. Anstead, Scientific Officer, has returned from his tour in Coorg, and will remain at headquarters until he goes on leave.

We publish the proceedings of two annual general meetings held by the Anamalai and Wynaad Planters' Associations. We would call attention to the useful information given by the former as regards its acreage under various products, which are a great help in the office as a record. Both Associations have much that is valuable to say on the question of labour, and are strongly appreciative of the work done by the Labour Commission. Those who have met Mr. Duncan will thoroughly endorse all that was said of him by Mr. Marsh and Mr. Robinson. We recommend for perusal those paras, dealing with the Madras Planters' Labour Law and the Labour Commission in the Annual Report of the Wynaad Planters' Association.

We reprint from *Capital* an article on the Nutrition of Plants showing the nitrogen contents of Sulphate of Ammonia and its cost compared with both in Nitrate of Soda.

"NAB" sends us a short and instructive article on how to be your own maistry on the Field. This is truly a good method of getting your money's worth and is a short way of getting rid of wasters and a check on writers,

Under the head of Correspondence, we have much pleasure in publishing a letter from the Hon'ble Mr. Barber to the Secretary, which in the first instance was intended for circulation to Honorary Secrecretaries of District Associations for their members. But the Labour Committee very wisely have decided to give Messrs. James Finlay & Co's. condition a wider circulation by utilising these columns, so that every individual planter may be able to see them and digest them, for himself, as at this time of the year many men find it inconvenient to attend meetings.

We have much pleasure in publishing the information supplied by the National Bank that the net profits to 31st December, 1913, amount to £358,625 and that the Directors propose a dividend at the rate of 16 per cent, for the half year.

DISTRICT PLANTERS' ASSOCIATIONS.

The Anamalai Planters' Association

Proceedings of the Eleventh Annual General Meeting of the Anamalai Planters' Association, held at the Old Valparai Bungalow, at 10 a.m., on Monday, the 16th February, 1914,

PRESENT.—Messrs. Geo. L. Duncan (Chairman), G. A. Marsh, C. R. T. Congreve, H. W. de Salis, A. A. Robb, C. Howland, J. H. Ireland-Jones, J. E. Samson, R. Brierley, J. Jeffrey, E. W. Simcock, M. B. Pollard-Urquhart, J. E. Scott, A. C. Cotton, J. Hatton Robinson (Honorary Secretary). *By Proxy*—Mr. R. Fowke. *Visitor*—Mr. J. Carless.

1. TO CONFIRM THE MINUTES OF PREVIOUS MEETINGS.—The Minutes of General Meeting held on 19/12/13 and of the General Committee Meeting held on 30-12-13 were confirmed.

2. ANNUAL REPORTS AND ACCOUNTS.—(*a*) The Honorary Secretary's report—

"Mr. Chairman and Gentlemen,—I beg to lay before you my Annual Report for the past year—

1. MEMBERSHIP.—We have now 12 Estates on the Register, or two more than last year and 29 subscribing Members.

2. MEETINGS.—Since the last Annual General Meeting, there have been three General and six Committee Meetings which have been well attended.

3. FINANCE.—The Financial position of the Association is very satisfactory. Some Members have sent me in their subscriptions since I closed my Books, and these are not credited in the accounts tabled, but, when they are so, the Association will carry over Rs.1,267-9-8 to the credit of the General Fund, which is most satisfactory, as our Annual Subscription to the U. P. A. S. I. for 1913-14 has already been paid.

The Money collected on behalf of the *Hospital Fund* is shown under a separate account in the Books.

PLANTERS' BENEVOLENT FUND.—I beg to thank those Members who have readily agreed to become Subscribers to this deserving Fund. I am glad to be able to report that 17 of our Members now support the Fund.

4. SEASON AND CROPS.—The Monsoon was lighter than usual, and rather "CATCHY" for planting operations, but, on the whole, new clearings have been a success. Although the weather was more or less ideal for Coffee off which bumper crops have been harvested. More rain during November and December would have suited Tea and young clearings. Cardamom crops have been fair. Prices for the different products have been well maintained.

The acreage under cultivation is as follows:—

Under Tea.	Under Coffee.	Under Cardamoms.	Under Rubber.	Under Rubber & Coffee.	Under Cinchona.	Other Products.
3838	1784	2285	1115	421	290	18=9,751 acres

These figures show an increase of 2,292 acres put under cultivation, mostly under Tea, during the past two years.

5. LABOUR.—This year the Labour was very late in coming up after the hot weather, and when coolies *did* begin to come in, many of us looked in vain for many "Ramasawmys" and many gangs that we afterwards learnt had been enticed away to Ceylon and the Straits where, according to the many attractive Pamphlets issued by Foreign Recruiters, our Coolies need not work unless they like, get well paid for doing nothing, and be most carefully nursed should they become sick, this latter being most unlikely as "the promised land" is stated to be so exhilarating and salubrious.

It is a matter of great satisfaction to know that the U. P. A. S. I. is at last making a determined effort to put a stop to this sort of nonsense, and your Association is to be congratulated on being the one Association which has taken up "LABOUR" so strongly at all the recent Annual General Meetings of the Central Association, and that it is now unanimous in backing the proposed Labour Commission Scheme with its total acreage.

We have all watched with intense interest the splendid work done by Messrs. Abbott, Nicolls and Barber, and we are glad that we are in a position to support them whole-heartedly in endeavouring to make their efforts a success.

6. MEDICAL.—As you are aware another Hospital site was felled and has been abandoned, and yet another site chosen and is about to be felled. As this is the third site, it may prove to be "the charm"?

The temporary Local Fund Hospital has been run in a very unsatisfactory way during the past year, and in spite of letters to the President of the Taluk Board and the D. M. O. pointing out our grievances, matters have not greatly improved.

7. TRANSPORT.—The Aerial Ropeway Scheme is still before the Association. The matter would seem to be far more complicated than at first anticipated, and it appears that experts for the Ropeway, Electrical Plant, Water Motor Plant, will each have to go thoroughly into their own particular line before any definite estimate can be made of the approximate cost of the scheme.

8. TOWNSHIP SCHEME.—The thanks of the Association are due to the Hon'ble Mr. Barber for negotiating with Government on our behalf over this scheme. Mr. Marsh has very kindly put up Rs.1,500 to enable operations to be started.

A working Committee was formed to carry out the work and I am informed that they have already begun clearing.

9. POST AND TELEGRAPHS.—A new combined Post and Telegraph Office has been sanctioned, and will be erected on the new Township site.

It was with sincere regret that the Members of this Association learnt that you, Sir, had decided to retire from Planting, and that you would shortly be leaving the District for Home.

At an informal meeting held at the Valparai Bungalow, on June 13th, 1903, you proposed the formation of this Association. Since those days of the Association's infancy you have taken the keenest interest in everything connected with its welfare, and have been held in high esteem for your impartial views on the various important matters brought from time to time before the Association.

You take away with you the good wishes of all of us.

The Accounts are now before you, and if found correct, I would ask you to pass them, and to kindly accept my resignation.

I wish to thank you, Sir, for the willing assistance you have always given me, and for placing your Bungalow at the disposal of the Association for holding the last 5 Meetings in.

I also beg to thank you, gentlemen, for the great consideration you have shown me during the last two years, in which I have had the honour of being your Honorary Secretary, for which position I do not seek re-election."—Applause.

(*b*) The Chairman's Address—

"Gentlemen,—It has been the custom for your Chairman to address you at these meetings but I have little to add to the Honorary Secretary's Report, a most satisfactory one as far as our finances are concerned.

HOSPITAL AND MEDICAL.—The position as regards these matters is not at all satisfactory, and for this I do not think we are entirely to blame. Having asked for assistance from Government, I suppose, if we accept it, we must do so on their own terms, but if we are going to pay the Piper we surely should have a voice in calling the Tune. I have always held that if we are to obtain the full benefit of a medical institution in our midst the medical officer must be under our control and the rules drawn up to meet the needs of the Community and not framed to conciliate refractory Government Officials.

There is another point too which has perhaps been overlooked. The District will, I believe, sooner or later require a European Doctor. It is growing rapidly and conditions have changed greatly since we first applied for Government aid. Government is not likely to provide a man of this kind, and if, or when, such an appointment is made, the hospital should, I consider, be under his control. I may be told I am looking too far ahead, I do not think so.

THE TOWNSHIP SCHEME appears to be bound up with the site for the hospital and as the Honorary Secretary has told you it has been possible to begin felling this site owing to Mr. Marsh's handsome offer to provide the funds until the details have been settled.

POST AND TELEGRAPHS.—We have I think to congratulate ourselves on the progress in this direction and have again to thank the Hon'ble Mr. Barber for what he has done for us in this respect.

I think, however, the time has now come to approach the Department regarding the transport of mails to and from rail head. I see no reason why the service should not be improved greatly in this respect.

LABOUR.—I will not say anything on this subject except to express the hope that at the Extraordinary General Meeting to be held next month, the United Planters' Association of Southern India will justify its name and existence.

TRANSPORT AND COMMUNICATIONS.—Your Honorary Secretary has touched on the suggested Aerial Rope-way and pointed out that this is a more complicated scheme than was at first anticipated.

We certainly do require a second string to our bow as emphasised at the last annual meeting. The Aerial rope-way must be a costly undertaking, and at best, must leave a gap at either end.

In view of the large area now taken up for planting, and with the district developing at the present pace, it seems to me that a direct line of communication with the West Coast should receive careful consideration.

With Perambikulam only 8 or 9 miles distant from the Western Estates on a fairly easy gradient this link in the chain should not be difficult to form, and with a harbour at Cochin the advantages to be gained by a direct line to that part would be enormous,

In resigning the Chairmanship I have to thank you all for your help and consideration, but especially our Honorary Secretary. We have all, I think, been working pretty well up to our collars and I have not had the time to give to district affairs that I should have liked, but with an Honorary Secretary like Mr. Robinson my duties were merely nominal, and I think the Association is under a debt of gratitude to him for all he has done. It is no light work that of a Honorary Secretary in a growing district with all manner of questions cropping up calling for prompt attention and leading to much correspondence.

I should like to thank Mr. Robinson for his kindly reference to myself and my connection with the Association. I am sorry to think that this will probably be the last of your Meetings which I shall attend. I know I shall often look back and wish to be at work among you again, but I am glad to have had the opportunity in however small a way of assisting in the early development of this district, which I believe has a great future."—Loud Applause.

Proposed by Mr. Marsh and seconded by Mr. Howland and carried unanimously; "That the Honorary Secretary's report be adopted and printed with the proceedings of the Meeting."

Messrs. Scott and Simcock were appointed to audit the Accounts, which were found correct.

3. REVISION OF THE RULES OF THE ASSOCIATION.—After the Chairman had read through the existing rules of the Association the following rules were altered to read as follows:—

Proposed by Mr. Congreve, and seconded by Mr. Simcock that Rule No. 7 reads as follows:—

"That the Committee shall consist of the Chairman, Vice-Chairman, the "Honorary Secretary, and four other Members who shall be appointed by "nomination at the Annual General Meeting, and that the Committee shall "have the right to replace any retiring member pending confirmation at the "next General Meeting."—Carried.

Proposed by Mr. Robb, and seconded by Mr. Congreve; that Rule No. 10 reads as follows:—

"That an Extraordinary Meeting of the Association may at any time "be convened by the Chairman, (or in his absence from the district by the "Vice-Chairman), and the Honorary Secretary jointly, or by any three "Members of the Association, who shall request the Honorary Secretary, "on receipt of their letter, to call a Meeting at the first possible opportunity. "All subjects to be discussed shall be submitted to the Honorary Secretary "to be put on the AGENDA, and no other subjects than those specified shall "be discussed at the Meeting so called."—Carried.

Proposed by Mr. Jeffrey and seconded by Mr. Cotton: that for the words "FOUR MEMBERS" in Rule 14 (*a*), the words "SIX MEMBERS" should be substituted.—Carried.

Mr. de Salis wished his name recorded as voting against *any* alteration of the existing rules.

4. MINOR FOREST PRODUCE.—Proposed by Mr. Congreve and seconded by Mr. Marsh and carried unanimously:

"That from the 1st June, 1914, the Original Capital be paid back to "the Shareholders, and that the Minor Forest Produce be then taken over "by the A. P. Association."

5. LABOUR (*a*) DISTRICT RULES.—The new Rule, Item No. 5 (*b*) of General Meeting of 19/12/12 was again read and confirmed.

(*b*) LIMITING ADVANCES TO Rs.10 PER HEAD PER COOLY.—Proposed by Mr. Simcock, and seconded by Mr. Robb:

"That Members of this Association do hereby bind themselves to limit "the Labour Advances to Tamil Maistries, from this date, at a maximum "rate of Rs.10 per head."—Carried unanimously.

The above resolution refers to Tamil labour only.

(*c*) KARDA LABOUR.—This matter was dropped owing to the resolution passed regarding the Minor Forest Produce.

(*d*) PROPOSED LABOUR COMMISSION.—Mr. Robinson was unanimously elected to represent the Association as a Delegate at the Extraordinary General Meeting of the U. P. A. S. I., to be held at Bangalore on the 11th March, 1914.

6. LIQUOR SHOPS FOR THE DISTRICT.—It was decided that the Liquor Shops should be placed at the following localities:—

1. On Lower Paralai Estate, between the 22nd and 23rd Milestones.
2. On Sirukundra, half way along the new Cart Road.
3. On Kaliaapandal, in Bungalow field.

Proposed by Mr. Robb and seconded by Mr. Congreve:

"That the maximum supply of arrack for a man be limited to one "bottle per week."—Carried.

Proposed by Mr. Jones and seconded by Mr. Marsh:

"That the CHIT SYSTEM of issuing liquor be tried for six months."—Carried.

Proposed by Mr. Robb and seconded by Mr. Congreve:

"That the Honorary Secretary do write to the Abkari Department, and "ask at what rates Liquor will be sold wholesale to the Licensees and at "what rates it may be retailed to the consumers; and further that the "Association may be informed what powers the Licensees will have, and "whether they will be at liberty to refuse Liquor to undesirable persons."—Carried.

7. MEDICAL.—The President of the Dictrict Board's letter No. R. Dis. 25/D. B. of 1914, dated January 28th, 1914, was read to the meeting.

In view of the above letter it was proposed by Mr. Congreve, and seconded by Mr. Robb:

"That the Chairman and Honorary Secretary be requested to come to "some arrangement of fixed charges with the Sub-Asst. Surgeon at present "in charge of the temporary Hospital (1) for Medical attendance on "Europeans, (2) Writers and Tea Makers, (3) other Estate Labour. Also "that they draw up a Scale showing the actual mileage from the present "temporary hospital to the centre of each estate, the mileage to the taken "along the shortest possible Government Road or Government Bridle path, "or where these do not exist by the usual road used by the estate, and "that the Scale be sent to the President of the District Board asking him to "sanction it, and have the same posted up in the local Hospital."—Carried.

Before the election of Office Bearers came on, Mr. Marsh said that he would like to have the attention of the Meeting for a few minutes as he was sure what he was going to say would have the sympathy of every one present.

Mr. Marsh then addressed the Meeting as follows:—

"Gentlemen,—I am sure we all feel that this Meeting should not disperse without a reference being made to the retirement of our Chairman, Mr. Duncan. I am no hand at making a speech, but as Pioneer of the Anamalais and as his oldest neighbour, it possibly falls on me to "say a few words," and I know I am expressing the feelings of the whole of our community when I say we are unanimous in our regret at losing him so shortly. He has been in our District for over ten years, and during the whole of that time he has proved himself a first class Planter and good all round sportsman and gentleman who has "*always played the game*" and this is doubtless the reason he is so universally popular among us. The prosperity of the estate over which he has had control is perhaps the best monument to his ability as a Planter and man of business. But in a Planting District it is by no means easy to be a good neighbour and sincere friend, but, I think, I can unhesitatingly say Mr. Duncan holds this unique position with all of us. He has been ever ready to lend a helping hand when we were in difficulties, and as our Chairman he has done a great deal towards "keeping the peace" and trying to keep us harmonious.

His retirement from our District so shortly will be a very great loss to us all, and we shall greatly miss his cheery voice at all future meetings, whether social or otherwise. To me, personally, his departure will be a very severe blow, for, he was one of the first to join me up here after I had started the District, and I have always felt that in those early days he was a great help, especially at times when one was depressed or downhearted, for he was always ready with good sound advice and words of encouragement.

I know, gentlemen, you will all readily join me in wishing Mr. & Mrs. Duncan "Bon-Voyage" and the best of good luck and happiness wherever they may be and at my expressing on behalf of us all our genuine regret at so soon losing an honest and dear old friend."—Loud Applause.

Mr. Duncan, on rising to reply, spoke with emotion. He thanked Mr. Marsh for the very kind way he had spoken about him, and said that he had always had the interests of the District at heart, and that he had always tried "to play the game."

He said he keenly felt leaving the District which he had seen grow up out of the forest to its present size.

He thanked both one and all, and wished them all "GOOD LUCK" for the future.

ELECTION OF OFFICE BEARERS.

The following gentlemen were elected as Office Bearers for 1914.

Chairman	...	Mr. C. R. T. Congreve.
Vice-Chairman	...	Mr. J. Hatton Robinson.
Honorary Secretary	...	Mr. J. E. Scott.

After hearty votes of thanks were passed both to the Chairman and the Honorary Secretary, the Meeting terminated.

(Signed) G. L. DUNCAN,
Chairman.

(") J. HATTON ROBINSON,
Honorary Secretary.

Wynaad Planters' Association.

Proceedings of the Annual General Meeting held at the Meppadi Club, on February 4th, 1914.

PRESENT.—Messrs. Bisset, Bownass, Gauld, Macleod, Malcolm, Milton, Vernede, West, Winterbotham and Abbott (Honorary Secretary). *Visitors.*—Messrs. Cammiade, Divisional Officer and Mr. Lord,

Mr. Malcolm in the Chair.

1880. *Proceedings of last Meeting.*—These were confirmed with the exception of para. 1875, the proposed Labour Rules, which it was agreed to discuss further.

1881. *Attesting Contracts in Mysore.*—(para. 1873) No reply has been received to the Association's request to have Patels appointed to attest contracts. It was suggested by Mr. Cammiade that the Association should ask the Madras Government to allow the Courts to recognise Patels' attestations, giving reasons. It was resolved to do this, and also to again address the Mysore Government.

1882. *Election of New Members.*—The following were elected: Messrs. Rowsell Bell, C. Raitt, A. H. Simpson (Manantoddy) Mr. T. P. Gauld (Vayitri). There were 5 other gentlemen resident in Manantoddy, proposed by Mr. Winterbotham, who will be elected at the next Meeting, but who had not stated the acreage they controlled as is necessary under Rules 7 and 8 of the Association.

1883. *The Annual Report for* 1913 was read by the Honorary Secretary.

" Mr. Chairman,—This Meeting ought to have been held in January, but I had to attend a Meeting of the Executive Committee of the Labour Commission in Ootacamund last month, and as there was likely to be an important statement made by the Hon. Mr. Barber about the Commission at the Nilgiri Planters' Meeting, I thought it better to postpone our Meeting till the Report was published. I hope you will approve of my having done so.

We have elected 3 new Members during the year, and 4 have resigned having left the District. There are at present 30 subscribing Members on the list, besides Honorary Members, and there are 8 Gentlemen in North Wynaad who wish to join.

We have held 6 General Meetings in 1913.

Rules of the Association.—These were printed and circulated as amended at the beginning of the year,

Roads.—No complaints of the state of the District Board Roads in Wynaad have been brought to the notice of the Association during the year. The Chural Mulla bridge has been reconstructed. The Committee of North Wynaad Planters who intend to join the Association wish to raise the question of bridging the Pannamurra and Manantoddy Rivers which during the Monsoon often cut off communication between North and South Wynaad.

Post Office.—There was a great deal of dissatisfaction expressed at the beginning of the year about the delay in the delivery of parcels at Wynaad offices. There has been a considerable improvement since then, and parcels are not now allowed to accumulate for a week or longer in Calicut

before being despatched. But we have not got back to the normal state of business, which was that parcels always arrived a day later than the letter of advice. Locally Postal affairs were complicated by the serious illness of the Meppadi Postmaster, in July. He had been working single handed for some months though far from well, his Assistant having been transferred to Calicut. Finally he had to take to his bed on July 13th and for a week or more no telegrams, registered letters, money orders or parcels could be delivered or despatched. The Postmen sorted out the ordinary letters as well as they could. The Superintendent of Post Offices wrote that he only heard of this state of things on the 18th. If this can happen in the case of an important office with a number of Europeans living in the vicinity, one wonders how many Postmasters of small up country Offices habitually live in Madras or other centres of gaiety, returning to their stations once a month to draw their pay and dispose of any business that may have accumulated in their absence.

Telegraph Department.—We asked to have a Telegraph Office established at Sultan's Battery in the beginning of June, but repeated enquiries addressed to the Superintendent West Coast Division as to the amount of guarantee required from the neighbouring estates failed to elicit any information. I mentioned the matter to Mr. Barber, in January, and he was able to telegraph what I wanted to know the day he returned to Ootacamund. Our thanks are due to him, and I hope the business will now go through. There is little or no risk in giving such a guarantee, as it has been repeatedly proved that the new offices always pay their way.

Madras Planters' Labour Law—This is still only in force in this Taluk of Malabar and in the Nilgiri District. The U. P. A. S. I. has agreed not to discuss the Act except under special circumstances, and since that decision I have refrained from any criticism of the law or any reference to it. I break through my rule now only to mention two matters which are of importance to us while we have to work under it. One is the practical impossibility of getting coolies contracts attested in Mysore. No Official below the rank of Revenue Inspector is authorised to do so in the State. We had previously asked H. H's Government to remedy this defect, without success, pointing out that Adigaris are allowed to attest contracts in British Territory. We repeated our request last October, but have had no reply. The consequence is that not one in a hundred of the agreements made in Mysore is in order and that those of our Maistries who get Patels (the equivalent of Adigaris) to attest their contracts have their cases thrown out, while merely verbal contracts made in Mysore or elsewhere to work in any other District are recognised by the Courts. This places our Maistries at a considerable disadvantage. The other matter I wish to refer is what was said by the Madras Government when reviewing the reports of the Collectors of Malabar and the Nilgiris on the working of the Act. The Chief Secretary animadverted n the large number of acquittals that had taken place, and instructed the Collectors to watch the figures in future years and satisfy themselves that the provision of the Act are not being used improperly. The insinuation I suppose is that Planters' servants if not Planters themselves habitually bring false charges under the Act, whereby the happy peasant is dragged from his humble home, and only saved from a life of slavery by the intervention of the Magistrates. I was puzzled by this charge, as I had heard no special complaints. The explanation is simple enough and was pointed out to me by Mr. Malcolm : it is that in many cases when a Maistry or a cooly has been arrested and expresses his willingness to work out his contract, the employer withdraws his case, and this is recorded as an acquit-

tal. The safe course appears to be to have a conviction recorded and then to apply under Section 33 to have the prisoner handed over to you. A more useful line of enquiry would be for Government to find out the cause of the large number of cases that remain pending at the end of every year owing almost invariably to the accused not having been arrested: At the beginning of 1912 there were 1,207 cases pending, 2,142 cases were brought into Court, and at the end of the year 1,501 were pending.

Labour Commission.- This is the most important subject that has come before us this year at any rate. I have said and written so much about it that you will not expect me to enlarge on it to-day. I know that nearly all the Members present are in favour of the establishment of a Commission, and have done their best to persuade their Directors to join it. The North Wynaad Planters are also supporters. We have the very clear and able statement made by the Hon'ble Mr. Barber at the recent Nilgiri Meeting to explain the objects of the Labour Department; and we have the fact that a firm of the standing of Messrs. James Finlay & Co. are convinced of its necessity. You have the Planters in the Kanan Devans who have had a Labour Department of their own working for the last ten years, unanimously in favour of it. You have the Ceylon Planters who, as I have remarked before, are often held up to us as examples of all that Planters ought to be, cheerfully increasing their subscriptions to their own Commission by 50% to extend its usefulness. You have the fact that some of yourselves are obliged to employ Agents in the recruiting Districts to look after your Maistries. It appears plain that an amalgamated Department working for the whole of South India would be more effective than a number of small Agencies often working in opposition and without the standing, necessary to combat outside interference. There are few of us who have had all the coolies we wanted during the past year, and the figures given in the G. O. on the working of the Labour Law show that there has been endless trouble in getting Maistries and coolies to fulfil their contracts. You have all had the opportunity of reading what was said by the Delegates at the U. P. A. S. I. Meeting and by Mr. Barber.

But the remarks made by the Collectors of Malabar and the Nilgiris in explanation of the large increase in the numbers of prosecutions under the Act in their report to Government (in Wynaad from 665 in 1911 to 1,047 in 1912 and in the Nilgiris from 862 to 1,095) ought to receive close attention. There will I imagine be a large increase shown again in 1913.

Mr. Innes writes: "Doubtless the causes indicated in my last year's "report have something to do with it and probably another cause is the "growing difficulty of getting labour. More and more coolies are required "every year for the tea and rubber estates in Ceylon, the Straits, Travan- "core and Cochin as well as in Malabar and other British Districts and as "a result it may be surmised that coolies have greater temptations than "before to abscond, that Maistries are advanced with less circumspection "and that they crimp one another's coolies more than they were wont to do.

Mr. Young writes: "No estates were newly opened in the district during "the year to account for the increase. The increase is therefore mostly due "to keener competition for coolies owing to the demand in the large number "of rubber, tea and coffee estates in Travancore and Cochin which are of "comparatively recent growth. As already reported by Mr. Rice in his "letter D. D. 585/11 M., dated 18th September, 1911, coolies desert and "make their escape into Travancore and Cochin, and they are fast becoming "aware that by so doing they can effectively evade arrest by their former "employers."

These are the very matters in which the Commission will help Planters. Though the descriptions of our present difficulties were written before the subject of the Labour Commission was introduced, they might have been taken from letters of its advocates.

I will now ask you to pass the accounts if found to be correct and to accept my resignation."

The accounts were found correct and ordered to be printed with the proceedings.

Mr. Malcolm proposed a very hearty vote of thanks to Mr. Abbott for his work as Honorary Secretary, and to him and the other members of the Executive Committee of the proposed Labour Commission (the Hon'ble Mr. E. F. Barber and Mr. J. S. Nicolls), seconded by Mr. Bownass and carried unanimously.

Mr. Abbott thanked the Chairman and the Meeting. He said that the work of the Honorary Secretary of the Association was not very heavy, but that he was gratified on behalf of his friends on the Committee of the Commission and himself for the kind way their work had been appreciated. They had had a great deal to do, but they did all they could cheerfully, believing it was only by getting the Commission established that their labour troubles would be settled. He hoped that their efforts would be successful.

1884 *Honorary Secretary* 1914.—Mr. Abbot was re-elected.

1885 *South Mysore Planters' Association Jubilee.*—It was resolved to write to the Chairman of this Association and congratulate him on its completion of 50 years of existence, and on the fact that they still had one of their original Members, Mr. Graham Anderson, C. I. E., on the rolls.

(It should be mentioned that the actual records of the Wynaad Planters' Association only date from 1873 when Mr. E. S. Thompson was Hony. Secretary, since when there are regular yearly lists of members and accounts. But Mr. Winterbotham who was present at this Meeting stated that the Association existed for several years before this.

An old diary of Mr. James Boosey for 1863 and 1864 records his attendance at Planters' Association Meetings from time to time Mr. Innes has also very kindly shown Mr. Malcolm and the Honorary Secretary a most interesting account of a tour made by Sir Clements Markham in 1866, where he mentions that there were then 3 Planters' Associations in the District, North Wynaad, South Wynaad and South East Wynaad.)

1886. *Proposed Labour Commission.*—Mr. Malcolm spoke on this subject urging the necessity of the Commission. The Honorary Secretary was elected as Delegate to attend the Meeting at Bangalore on March 4th.

N.B.—It seems probable that this date may be altered.

1887. *Post Office.*—Read letter from Superintendent of Post Offices, Calicut, dated December 9th, 1913, stating that if *the Vellera Mulla Post Office* were transferred to Pootoo Mulla it would be necessary to employ an extra runner on Rs.7 a month, and that the income of the office will not allow of this being done.—Recorded.

Office at Dindimul.—Mr. Winterbotham proposed, and it was resolved, that the Honorary Secretary address the Departments concerned asking to have a combined Post and Telegraph Office opened at Dindimul. The Companies concerned are prepared to guarantee Government against loss,

Mr. Winterbotham stated that owing to interruptions during the Monsoon it would be desirable to have this Office connected by wire with Tellicherry instead of by an extension from Manantoddy. Mr. Winterbotham also proposed that the Department should be asked to establish a *Post Office at Koroth.* This was agreed to.

1888. *Taluk Board Membership.*—Dr. Milton has been appointed to succeed Mr. Stewart.

1889. *Rubber Exhibition.*—Read correspondence. There is very little rubber being harvested in Wynaad at present. As one important Firm connected with the District is stated in Mr. Staines Manders' letter to have secured space, it was considered that it might be left to them to exhibit any Wynaad produce they thought fit.

1890. *Labour Rules.*—With reference to para. 1875, Mr. Malcolm explained the proposal of the Committee appointed to report on this subject. It was resolved to discuss the subject at the next Meeting.

1891. *Bridging the Manantoddy and Pannamurram Rivers.* —Read correspondence. Mr. Cammiade explained the proposals of the District Board which was to provide shallow portions, which, it is hoped, will be available at all times of the year.

A vote of thanks to the Chair terminated the proceedings.

(Signed) B. MALCOLM,
Chairman.

(„) C. E. ABBOTT,
Honorary Secretary.

PLANTS.

The Nutrition of Plants.

It is only during the second half of last century that the true theory of plant nutrition has been definitely established. As a result of prolonged and careful experiments it has been proved that a plant must obtain by means of its roots certain definite substances for itsnutrition. These substances are as a rule found in abundance in all fertile soils with the exception of Nitrogen, Phosphoric Acid, Potash and sometimes Lime, which are often in deficient quantities. For this reason manures which supply these four constituents are applied to the soil by the planter for the successful raising of crops. The principal action of manures is *to restore the fertility* of soils which have been exhausted by continuous cropping, *to prevent exhaustion* of the soil and *to enrich* in plant food soils naturally poor. Amongst the substances required by the plant, Nitrogen takes the first place. Cultivated soils, especially in Tropical and Sub-tropical countries, are found deficient in Nitrogen as the soil is much more rapidly exhausted of its available Nitrogen than of its available Phosphoric Acid and Potash. Hence when nitrogen is applied as manure in a suitable form, it has a direct and immediate effect upon the plant.

Both from field experiments and from the experience of the farm and plantation certain general conclusions may be drawn on the functions of Nitrogen in the nutrition of the plant.

1. Nitrogen is mainly concerned with the vegetative growth of the plant.

2. A deficiency in Nitrogen results in stunted general growth.

3. The other substances, Phosphoric Acid, Potash, etc., are made use of by the plant in proportion to the Nitrogen supply.

The best and most concentrated form of Nitrogen at the planters' disposal is *Sulphate of Ammonia.*

Among the chief advantages of Sulphate of Ammonia, over any other form of Nitrogenous manure on the market, are the following :—

1. Sulphate of Ammonia has a higher Nitrogen content than any other fertiliser, the ordinary commercial Sulphate of Ammonia containing 20·6 per cent. of Nitrogen.

2. Pure Sulphate of Ammonia is completely volatilised on heating. When a little Sulphate of Ammonia is placed on a red hot iron plate and the plate kept at red heat, all the Sulphate of Ammonia will volatilise as a white smoke, leaving no residue behind. So adulteration of the manure by admixture with any other salt or substance can be easily detected.

3. When applied to the soil Sulphate of Ammonia is very rapidly absorbed and hence heavy rains and flood water do not wash it out of the soil into the drains of the sub-soil and thus lost to the plants, as it happens with other forms of concentrated nitrogenous fertilisers.

4. Sulphate of Ammonia feeds the plant from the first and continues to do so throughout the whole period of growth, instead of forcing it suddenly and then leaving it without sustenance.

5. The beneficial effects of Sulphate of Ammonia are seen not only during the season of application but also the succeeding crop benefits by it.

6. Sulphate of Ammonia can be stored in a dry place for any length of time without fear of a loss of Nitrogen.

The quantity of Sulphate of Ammonia which may be applied with advantage along with Phosphates and Potash, and Lime if required, to practically all crops varies from $1\frac{1}{2}$ to $2\frac{1}{2}$ cwt, per acre.

Sulphate of Ammonia should be put on the land at beginning of rains or a little before it is required by the plant. It may be also used as a top-dressing for other crops, etc.

In buying fertilisers the cost of a unit consisting of one hundredth of a ton should be ascertained, such unit cost being obtained by dividing the price per ton of the fertiliser by the percentage of the constituent in question. To find the price of Nitrogen, we can take Sulphate of Ammonia and Nitrate of Soda which contain Nitrogen only and calculate the unit value as follows :—

	Price per ton.	Nitrogen per cent.	Unit value of Nitrogen.
	Rs.		Rs. A. P.
Sulphate of Ammonia ...	240	20·6	11 7 0
Nitrate of Soda ...	225	15	15 0 0

difference per unit of Nitrogen *in favour* of Sulphate of 1*s.* 8*d.* Ammonia.

The freight charges should also be considered for as much Nitrogen can be conveyed in 10 tons of Sulphate of Ammonia as in $13\frac{3}{4}$ tons of Nitrate of Soda.—*Capital.*

DUTIES OF A FIELD MAISTRY.

How to be your own Maistry or Kangany in the Field.

A Note on a very commonplace subject by "Nab."

The appliances required for a Superintendent to perform the duties of a Field Maistry with the minimum of personal inconvenience and trouble and the maximum results per cooly paid for are:—

Half a dozen Bamboo Poles each 10 feet long.

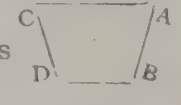
One section of cheap strong rope 200 feet long for every 10 coolies and 3 to 5 spare sections.

Perseverance in carrying the system through and patience in instilling its advantages (to the Superintendent and owners) into the heads of the Kanganies and coolies.

Having determined where your work is to be, you march off, armed with a pole and followed by the coolies and on arrival select a *base line*. Each cooly should provide himself with a peg 3 to 4 feet long. Starting from one end of your base line you mark off 2 lengths of your 10 ft. pole and at the end of each 2nd length a cooly places his peg and starts digging. The distance between every 2 pegs being 20 feet representing the width of the coolies task. Having thus disposed of all your labour along the base line you may pause (but the coolies need not).

The next step is to decide upon your task per cooly, 2,000, 4,000 or 6,000 square feet. Say you consider 4,000 sq. ft. should be performed per man and that your gang is 30 coolies. From each end man of the line run up a rope (200 ft. long) at right angles to the cooly. This will give the required length of the task. To ensure that each man does the full task top ropes running parallel to the base line should be put in and as 30 coolies at 20 feet each gives 600 feet three ropes will be necessary. You have thus a perfect parallelogram and the next step is to take the men's names. Start from any end you like but take the names *in the order the men are working*. Your work is now finished for the day. All that remains to be done is to take a stroll in the cool of the evening with a pole in your hand. If any portion of the parallelogram is not dug a rapid measurement and reference to your list of names will tell you who the offender is. Similarly with bad work

This slight outline of the system makes no mention of the slight difficulties encountered in the matter of patches, triangles, &c., which must of necessity be left over after the days's work but experience rapidly shows ways of dealing with them.

The principle governing the allotment of tasks and small irregular patches is triangulation; thus the contents of a piece shaped thus 

representing perhaps two or three coolie's work can be easily ascertained by taking the lengths of AC and AB multiplying and dividing by two and the same with BD and AB. The two resultants added together give the area of the patch. The most important to bear in mind is to start each day with a *fresh base line or lines*. Coolies must not be allowed to go on patches which can remain until the whole field is dealt with and then one or two days in the month can be devoted to patchwork when the whole area can be cleaned up.

The advantages of this system are obvious but will bear relation.

1st. It ensures that the task *paid for* is performed.

2nd. It makes the Superintendent the real head and takes away all illegitimate authority from the Writers and Maistries.

3rd. It encourages good men for a cooly may leave the field as soon as he has finished his line and not be compelled to wait for the evening roll and meantime have to do someone else's work.

4th. Coolies who are physically incapable, wasters, and shirkers are very soon discovered and can be either turned off the estate or set to lighter work where their full value can be obtained.

The most important in the whole arrangement is that you only *pay for what you get* with the added advantage that the Superintendent can see for himself what has been done and not depend, as seems largely to be the case, on Writers' and Maistries' reports.

The Author introduced this system some months ago on his Estate with rather surprising results. Within 6 weeks he had not a "Local" (Coast) cooly on the Estate though prior to the introduction of the system he used to count them in fifties, and up to the present his daily outturn of "Coasters" can be counted on the fingers of his two hands. This fact throws an interesting sidelight on the difference between *work done and work entered in reports as done*, for previously his Writer used to daily assure him that the coolies had done from 10 spaces (4,000 sq. ft.) to 14 spaces (5,600 sq. ft.) while under the rope system it was speedily discovered that on the same ground the men could not do more than 8 spaces (3,200 sq. ft.) and that with difficulty, the men working from 8 a.m. to 5 p.m.

Russia.

Proposed Law to Prevent the Adulteration of Foodstuffs and Beverages.—H. M. Embassy at St. Petersburg reports, on the authority of the local press, that the Ministry of the Interior has laid before the Council of Ministers, for their approval previous to introduction into the Legislative Chambers, a Bill which proposes to prevent the adulteration of foodstuffs and beverages, a practice which is stated to have assumed large proportions in Russia and is rapidly increasing with the general rise in the cost of living. Under the Bill, sentences will be imposed of fines up to £30 and of imprisonment for periods ranging from a fortnight to 3½ years; power will be granted for the confiscation of all the articles adulterated and for the destruction of the contrivances and materials used in the process of adulteration. Sentences awarded under this Law will be published in the newspapers at the cost of the offender, who will also have to exhibit on his premises a printed notice giving details of the conviction. It is also provided that those convicted be deprived, for a specified term, of the right to trade in foodstuffs or beverages. The enforcement of the proposed law and the duties of inspection will be entrusted to health officers and sanitary officials.

The Bill further provides that municipal and provincial administrative authorities in towns and districts with a population of over 25,000 shall erect laboratories in which to conduct the analysis of foods and beverages suspected of adulteration.—*The Board of Trade Journal.*

CORRESPONDENCE.

Ootacamund,
19th Fedruary, 1914.

FLETCHER NORTON, ESQ.,
Secretary, United Planters' Association of S. India,
Bangalore.

Dear Sir,—I am sending you herewith the stipulations laid down by Messrs. James Finlay and Company. The chief conditions were set forth at the Nilgiri Meeting last month, but the Executive Committee think that the full conditions should be in the hands of the Honorary Secretaries of District Planters' Associations.

The conditions are as follows:—

1. That exclusive of our area, the Department shows Subscribers representing not less than 80,000 acres and that a minimum subscription of 2 per acre per annum be guaranteed for 5 years, a period required for the thorough and efficient establishment of the business.

2. That the restriction of advances be recognized as a vital principal of the scheme and that it be put in practice from the start.

3. That the business of the Department be controlled by an Executive Com nittee consisting of:—

1. The Chairman of the U. P. A. S. I.
2. The Hon'ble Mr. E. F. Barber.
3 & 4. Two members of the KANAN DEVAN HILL PRODUCE COMPANY'S Labour Department.
5. The Chief Superintendent of the Labour Commission.
6. A Planter to be elected by Nos. 1, 2 and 5, from the General body of Subscribers.

4. That the Company's Superintendent of the Labour Department (Mr. A. Ff. Martin) be engaged to act for a period of five years as Chief Superintendent of the Labour Department, on the salary suggested by the Executive Committee of the Labour Department, *viz.*, Rs. 2,000 per month, with the allowance he is drawing now of Rs.55 per month, and, that the Company's Assistant Superintendent, Mr. C. E. L. Ward be engaged by the Department as Assistant Superintendent of the Srivilliputtur Circle on a Salary of Rs.500 per month with an allowance of Rs.50 per month.

5. That the Company's present Office Staff and Agencies be taken over and maintained by the Commission,

6. That the Company's Motor Car be taken over by the Department at a valuation.

7. That the Company's Buildings in connection with the Labour Department be leased to the U. P. A. S. I. Labour Department for five years at a rental to be agreed upon by the Hon'ble Mr. E. F. Barber and the General Manager of the Kanan Devan Hill Produce Company, Limited.

8. That at the end of five years should the Company be of opinion that the working of the Department has not been satisfactory they shall be at liberty to withdraw from it, altogether with their staff.

9. That we wish to record our opinion, that, in order to do justice to all the subscribers the Staff suggested by the Sub-Committee is inadequate, and that an establishment consisting of a Superintendent, a Deputy Superintendent and 8 Assistant Superintendents will be necessary. It should be borne in mind that the total area to be superintended is 125,000 square miles, which should be divided into ten circles.

Yours faithfully,
E. F. BARBER.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Officer supplies us with an article which is the result of his late tour in Coorg. The notes on Green Bug should be read most carefully. The treatment suggested should be followed. Experience and experiment will teach us the best and cheapest methods of combating this pest.

Treating stumps with acid calls for attention and Mr. C. W. Browne's account of his experience is valuable. He prefers gelignite for removing stumps.

The Annual General Proceedings of the Nilgiri Planters' Association are published and fill a good dead of space: but they contain subjects of general interest, especially on the Labour Commission. We specially draw attention to the speeches of the Chairman, the Hon'ble Mr. Barber and Mr. Nicolls, Honorary Secretary. The latter we note promises at no distant date to fill a page of the *Chronicle* with District notes which will be most acceptable. *Bis dat qui cito dat.*

By the courtesy of the Indian Tea Association we have received permission to make extracts from their Quarterly Journal published by their Scientific Department, and we reprint a very interesting article on Lime. As Lime is very deficient in the soils of Southern India (and we speak with more personal knowledge of those of Mysore) the article should be of great general interest and usefulness.

The Special General Meeting of the U. P. A. was held at these offices on the 11th and 12th inst. and was very well attended, only two Associations were unrepresented. We have time and space only this week to publish the resolutions that were passed, which will require to be confirmed at the Annual General Meeting which it was proposed to convene, subject to the sanction of the Chairman, early in July next. On the last page of this week's issue of the *Chronicle* we published a short epitome of the Meeting, drawing attention to the most salient features of it. It was altogether a very satisfactory meeting but if it is to bear fruit, will entirely depend on the planting community themselves.

THE SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Green Bug.—The Planting Expert returned on 5 March from a tour in Coorg in which he was accompanied by Dr. Coleman, the Director of Agriculture, Mysore State. The Green Bug on the Coffee was naturally an object of special attention during this tour and it is to be hoped that planters in the district will benefit by the valuable advice kindy given by Dr. Coleman on this subject, both at the Meeting held at Pollibetta and in the field on the various estates visited. The scale is just beginning to begin growth again and in several instances it was found to be still in the motile stage and quite young. All ideas of the monsoon or dry weather being able to kill it, and that it would disappear naturally are doomed to disappointment for it has made its appearance again, not only in the places infected last year, but in several new areas and there is no doubt that it will spread, and spread rapidly, if it is not taken in hand. A great danger lies in any neglect to tackle this pest *at once.* Any estate on which it is ignored will rapidly become a dangerous source of infection to the whole district; the scale will become spread over the coffee and get on to the shade trees and will then only be dislodged with the utmost difficulty. It is important to attack it at this time of the year, despite the difficulties of lack of water and coolies, as it is now just starting and is more easy to keep in check by means of a spray before it reaches the adult and young producing stage. Moreover if neglected it will spread from the leaves on to the young berries next month and here it does a great deal of harm. A young berry with a scale on it is unable to develop and falls off, while a bunch of fruit with scales attached to the fruit stalks seldom reaches maturity. In this way the pest reduces the crop and does damage almost as much as by attacking the leaves and stems and reducing the vitality of the tree. Methods of spur pruning adopted last year, while they no doubt served their purpose, and were absolutely necessary in the absence of enough sprayers, have never-the-less proved disappointing, and most of the areas treated in this way are now reinfected, while the shape of the trees has been irretrievably spoiled. It is necessary to prune the trees sufficiently to allow the coolies to get among them with a sprayer and they should then be sprayed. Spraying indeed appears to be the only really reliable method of control. At the same time a crusade should be instituted against ants and as many nests as possible destroyed both on the ground and in the shade trees. A torch or blow lamp appears to be the readiest method of dealing with ants nests where they can be got at. At this time of the year the ants will be found busily tending the young scales or bringing them out of the places where they have been sheltered and placing them on the trees.

The pressure type of sprayer is proving an excellent and handy machine in the field and a much cheaper one than the Holder can now be obtained in the form of the Deming Aerospra which costs Rs.24 boxed and delivered at the railway station in Madras. It is to be hoped that all Coffee planters are now provided with sprayers and sufficient insecticides to deal with an attack of Green Bug immediately upon its discovery. Success in dealing with this pest depends entirely upon promptitude. The Coorg Planters' Association at their next Meeting should make a special point of deciding upon concerted action with regard to this pest and seeing that all their members are prepared and ready to deal with it, while steps should be taken to approach the Government to give their aid in inspecting native coffee gardens and helping native growers to deal with the pest as soon as it appears.

In the monsoon it is evident that its parasitic fungus plays a large part in checking it and steps should be taken this year to introduce the fungus on to estates where it may not make its appearance naturally. This can most easily be done by tying branches of fungus infected scale into the trees in contact with branches covered with healthy scales.

The practice has been adopted with success on at least one estate on the Nilgiris. It may be possible at some future date to raise sufficient spores from a pure culture of the fungus grown in the laboratory to enable spraying to be done with these, but further study of the fungus is needed. It must be remembered that the fungus can only thrive under the moist atmospheric conditions produced during the monsoon and it is not effective in the dry weather. It probably exists during this season in some form of resting spore.

Treating Stumps with Acid.—In the *Planters' Chronicle*, Vol. VIII, 21 of 24th May, 1913, an extract from the *Queensland Agricultural Journal* was reproduced which described how stumps of trees could be destroyed by means of a mixture of Nitric and Sulphuric Acids. This lead to several enquiries and the Scientific Assistant for Mysore conducted some experiments with the method advocated with negative results. The Editor of the *Queensland Agricultural Journal* was communicated with and asked if he could kindly supply any further information, and he replied in the negative. In the December issue of that Journal there is an account of experiments conducted with the method by Mr. J. C. Brunich, the Queensland Agricultural Chemist, which shows that neither dry nor green stumps can be destroyed by the strongest acids which confirms the conclusion arrived at by Mr. Frattini that the method is useless. As the matter aroused some interest among planters of Southern India the article in question is quoted below at length :—

"There seems to have been some diversity of opinion as to whether dry and green stumps could be destroyed with acids, and with a view to determining the efficacy of this treatment, the Department decided to experiment in this direction.

"These experiments were carried out according to the following design, and included both dry and green stumps :—

1. Dry —1 pint sulphuric acid.
2. Dry —1 pint nitric acid.
3. Green—½ pint nitric acid, ½ pint sulphuric acid.
4. Dry —¼ pint nitric acid, ¾ pint sulphuric acid.
5. Green—¾ pint nitric acid, ¼ pint sulphuric acid.
6. Dry —¼ pint sulphuric acid, ¼ pint nitric acid.
7. Dry —1 pint nitric acid, 1 pint sulphuric acid.

"The stumps treated were of the spotted gum, box, and ironbark variety, and from 18 inches to 2 feet 6 inches in diameter.

"Holes were bored with a 2 inch auger in the stumps about 18 inches from the earth-line at an angle of 45 deg. to a depth of 18 inches. Each stump was then dosed according to the design; the holes were then immediately plugged with green plugs.

"Periodical notes were taken as to the action of the acids, and as six months have now elapsed, a sufficient time has been given to prove the experiment's success or otherwise.

"It must be understood that the whole of these stumps were perfectly sound and solid, also that two out of the three varieties, *viz.*, box and iron-bark--are extremely hard woods, and if the acid would eat through these stumps then the majority of other timbers would be easy victims.

"The final examination showed that, in the case of the dry stumps, in every instance the action of the acids had no appreciable effect, and beyond a very slight crumbling of the wood in extent about 1 inch in the immediate vicinity of the hole no other effect was noticeable.

"As regards the green stumps, in both instances the effect seemed to be slightly better. The wood in the immediate vicinity of the holes had rotted to a depth of about $2\frac{1}{2}$ inches, but beyond that sound wood was found; in addition both stumps had thrown out vigorous suckers.

"The above results clearly prove that sound stumps cannot be destroyed with either sulphuric or nitric acid or both, and these two acids are of the strongest known.

"The experiment has an additional value, inasmuch as it has provided the actual cost per stump as against other methods.

"The average cost per stump worked out at 1*s.* 9*d.*, which includes cost of acids and labour paid at the rate of 7*s.* per day; and it is an open question whether men could be found to work with two such dangerous acids at that figure.

"In the event of the success of the acids, the great drawback to clearing land by the method would be the vast amount of valuable time wasted in waiting for the stumps to rot away, irrespective of the danger of handling the acids, and when time is taken into consideration—and in every instance time is money--cheaper and quicker methods may be adopted,

"Mr. C. W. Brown (Jilliby) in the *Gosford Times*, recounts his experience in connection with the use of sulphuric and nitric acids for destroying stumps:—

"I thought I would have a try myself, as I have some heart-breaking stumps here, and as I take out everything in front of me, regardless of size, I thought that the acids would prove a great labour-saver. Having purchased 4 gallons of sulphuric and nitric acids (2 gallons each), I started operations on a green grey-gum stump 4 feet high, and diameter 4 ft. 6in. In that stump I bored three holes with the 2 in. auger, going the full depth of the auger, and in those holes I poured equal quantities of the acids, then plugged up with a green spotted gum plug, having previously put same in paraffin, which I had melted, and then also poured some of the paraffin over the plug to make certain that it was air-tight. I next tried a dead blackbutt stump, 10 ft. high and 4 ft. 9 in. across on the top, the girth at the butt being 24 ft. 2 in. I bored four holes with the 2 in. auger, going its full depth, and repeated the same process as I did with the grey-gum stump. After waiting patiently for six weeks I knocked out the plugs and refilled both stumps. From the time of refilling to the present day is five and a-half weeks, or in all eleven and a-half weeks, using in all $2\frac{3}{4}$ gallons of acids on the two stumps, and the only difference in them is what I pulled out with the auger. Having given the acids a first-class trial, I have to turn round again and use what I have been using for the last five and a-half years, gelignite, and it will be a hard job to find its superior."

R. D. A.

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

At the Annual General Meeting of the Nilgiri Planters' Association held at the Collector's Office, on Wednesday, the following members were present;—The Hon'ble Mr. E. F. Barber (in the chair), Mr. J. S. Nicolls, Honorary Secretary; Messrs. A. S. Dandison, H D. Wilbraham, C. H. Brock, L. L. Porter, W. A. Cherry, C. Gray, R. Rowson, W. C. Deane, D. Elkington, G. W. Church, Gerard Rogers, G. W. Fulcher, Browne, W. C. Hayne and R. N. C. Grove. *Visitors.*—Messrs. M. Young and S. Cox.

100. THE LATE MR. STEWART BROWNE.—Before the proceedings of the meeting opened the Hon'ble Mr. E. F. Barber alluded to the news just received of the death of Mr. Stewart Browne. Mr. Barber said he had been a member of the Association, a keen planter and a good sportsman and proposed that the Honorary Secretary be instructed to convey their condolences from the Association to Mrs. Stewart Browne on her loss. The resolution was carried unanimously.

101. ANNUAL REPORT.—The following annual report was then read by the Honorary Secretary and adopted.

" Mr. Chairman and Gentlemen,—I have the honour to submit to you my annual report and accounts for the year ending 31st December, 1913.

Membership.—At the commencement of last year we had 64 members. We much regret the death of two of our members, the late Messrs. Barclay and Wingrave. Two members, Mr. Sathasiva Mudaliar and Mr. Bannatine, resigned, the latter on leaving the country. 3 members have been removed from our list, and two members added, leaving us with 59 subscribing members on the 1st January, 1914.

Acreages on which members pay assessment;—

Coffee	...	4,740 acres.
Tea	...	5,280 ,,
Rubber	...	521 ,,
Other produce	..	1,473 ,,
	Total...	12,014 acres.

In sending out memoranda for the year 1914, I have asked all members to advise the Honorary Secretary of any alteration in acreage. I hope all members will do so (the assessment to the Association being $2\frac{1}{2}$ annas per acre on cultivated area).

Accounts.—These are on the table and have been audited by one of your members. They show a balance of Rs.849-8-2 to credit of the Association. There is due to the U. P. A. S. I. a sum of Rs.378-1-6, being $\frac{1}{4}$ of our annual subscription due in May, which leaves us an available balance of Rs.471-6-8. This year, gentlemen, I come before you with a clean sheet; all subscriptions have been paid up in full. I have now recovered all good back balances and all bad and doubtful debts have been written off. Because you have a balance of your credit now, I would not ask you to think yourselves wealthy. On your present acreage assessment, after paying U. P. A. S. I. subscription, you will have Rs.375 available for general Association expenditure.

1.	Office allowance is estimated for at	Rs. 150
2.	Delegates' expenses	,, 200
3.	Postages, stationery and printing for the last two years have been practically the same	,, 160
	Total Rs...	510

I think the office allowance unnecessarily liberal, and this year I have only drawn the allowance for 9 months.

No. 3 has been heavy for the last two years owing to a considerable amount of matter having to be printed. I think the office allowance might be estimated for at Rs.75 and that probably No. 3 will not exceed Rs.100, putting two Delegates' expenses at Rs.100 each, Rs.200, you will then be able to say you are not exceeding your income. The balance you now have in hand will be available for any extraordinary expenditure.

Gentlemen, I feel that if I have at all failed to satisfy you in the carrying out of my duties, in this respect, I can take to myself a little credit that on resigning my post I do not leave my successor a legacy of outstandings and a list of incorrect acreages. It may be that I have caused annoyance to a few by constant reminders, but I think if members would only for a moment consider that their Honorary Secretary is possibly a man having less unoccupied moments at his disposal than themselves, they would not let it be necessary for him to send out reminders which, to say the least, means extra expenditure.

Meetings.—There have been 4 general meetings and on all important matters which have come up between meetings I have issued circulars. The average attendance at meetings was 19 members. It is an improvement on any past year, but considering we have 64 members, the percentage of attendance is not good. Those who have come have been more or less regular, but I would have liked to see more. In all Association matters we are working for the good of our combined interests and well attended meetings must benefit any resolutions passed.

Crops and Weather.—I regret that I am unable to speak on this subject more than it relates to my own district. I had intended writing to a representative member of each district for information, but procrastination has only added another stone to that place which is paved with good intentions. I wish it would go in for rubber. District reports on crops and weather would make Honorary Secretaries' reports more interesting. I have had an opportunity of seeing more of your district during the past year. I specially refer to the upper plateau where tea is replacing coffee. I was much impressed with the growth and I congratulate all those interested on what can only be a prosperous future. I will not worry you over my own district, as I hope at no distant date to fill a page of the *Planters' Chronicle*. From all I hear we can congratulate an ex-member of our Association on a bumper coffee crop, and I hope it will mean his return to us.

Matters brought up for discussion.—Labour discussion and matters relative to labour have been much before us in the past year, and I feel certain that one and all of us must have recognized the fact that something must be done to put things right. The present uncertainty of what your future difficulties may be as regards labour can only mean stunting your future prosperity. Mr. Abbott in his report to the W. P. A. has written at length on this subject and in so doing has gone into points which I might have put before you. I am asking your Chairman to read that part of Mr. Abbott's annual report. You have all received a circular asking for your support to the proposed Labour Department on the lines laid down by the Executive Committee. Messrs. Finlay and Co. have agreed to lay the foundation stone, and naturally in doing so have made conditions. With their aid the department must become a success, without it cannot be started. From some replies I have received to the circular, it appears to me that members have not read those conditions, although they

were given by Mr. Barber in his speech at our last meeting. You have been asked for definite support, not conditional support. The estimated amount required for the working of the department has been drawn up by a man of known experience and who is running a successful Labour Department for his own firm. It has not been drawn up by novices. This must, I feel certain, appeal to the Nilgiri planter. Gentlemen, a great number of you gave your support "definitely and conditionally" to the scheme as previously put before you, and I feel certain will not turn your back on it, because it has been perfected.

Roads and Communications.—The bad condition of some of our roads has been brought to the notice of the authorities and satisfactory attention has been given to those complaints.

The Kil-Kotagiri Road.—This matter was brought up at our last annual meeting. The President of the District Board has intimated that the estimated cost of the road is Rs.34,000 and that the District Board is unable to find such a large sum of money, and wishes to know whether the Board can expect any initial contribution from the planters interested.

Railway Freight on Tea Seed.—This is a matter which was brought up by your Delegates at the last U. P. A. S. I. Meeting and the Indian Tea Association was asked to use their influence in obtaining concessions in the rates of freight on tea seed from all Railways in India. I copy the following from the proceedings of a meeting of the General Committee of the Tea Association held on 30th January, 1914, at Calcutta which will show you how the various Railway Companies have met us in the matter:—

"It was stated that the Committee understood that the only Railway which granted any concession in this connection was the Assam-Bengal Railway, which allows tea seed to be carried by passenger train at goods rate. Of the railways addressed, the Bengal-Dooars Railway had replied that, when booked as goods, tea seed is forwarded by the first train, whether a mixed or a goods train. The Darjeeling-Himalayan Railway had stated that their traffic in tea seed is very small and that it was not worth while altering their tariff. The Bengal-Nagpur Railway could not grant the concession asked. And the Eastern Bengal State Railway replied that the necessary orders had been issued that tea seed would be carried over the railway by passenger train at half parcel rates. Copies of the letters received from these Railways had been forwarded to the United Planters' Association of Southern India for information.

There had since been received a letter of 21st January from the South Indian Railway stating that as at present advised the Agent did not see the need for a reduction in the rates of tea seeds, but enquiring what other Railways addressed on the matter had said."

It seems a pity that railways cannot work on one basis.

Scientific Department.—This matter is on the agenda of the Extraordinary General meeting of the U. P. A. S. I to be held at Bangalore.

Act I. of 1903.—Representation was made to the District Magistrate that "Rubber" was not included in the definition of "estates." This has now been included—G. O. No. 2576 dated 12-12-13.

Planters' Benevolent Fund.—Rs.181-6-6 was subscribed by members of your Association as against Rs.45 in the preceding year.

Thanking you and Mr. Barber our permanent Chairman for the help he has been to me and for the support you have given me in the carrying out

of my duties, I now ask you to pass my accounts, if found correct and accept my resignation.

102. Mr. Barber's Speech.—Mr. Barber made the following speech :

"Gentlemen,—You have heard Mr. Nicolls' report and can see for yourselves that there is very little for me to add.

Membership and Accounts.—It is to be regretted that the Association does not receive support from every one in the district. Only 12,000 acres are represented and I believe the total area of planting is estimated at 30,000 acres. Non-members as well as members benefit by any work that is done by the local Association as well as by the parent Association and if more support were accorded, it would be for the benefit of all, and I hope we may see an improvement in membership during the year. This is all the more necessary as Mr. Nicolls has pointed out there is little or no margin between our income and our expenditure and without the wherewithal we cannot carry on. This Association was started on its present basis in 1892. A sister Association is just about to celebrate its jubilee and surely we are not going to drop out, while we are still so young.

Labour has overshadowed everthing else that has been before us during the year, but other matters are not at a stand still.

Scientific Officer—Mr. Anstead has nearly completed the 5 years of his term and negotiations are now in progress with Government for the retention of his services. Our Association accorded the original scheme the strongest support and it is satisfactory that the resolution which we passed at our meeting of 16th July last, with a view to retaining Mr. Anstead's services, was adopted by the General Meeting at Bangalore. A further resolution was passed asking for the services of a Mycologist and this shows that the community as a whole is convinced of the necessity of scientific research in the matter of our crops. A further proposal has been made that the head quarters of our Scientific Department should be moved to Coimbatore, so that our staff should have the advantage of constant intercourse with men who are working on similar subjects throughout the country and I know that this proposal is under the consideration of the Chairman. The subject is on the agenda and you will no doubt instruct your Delegates as to your views.

Weight and Measures.—A good many years ago this subject was taken up by the U. P. A. S. I., and in 1905 Mr. Aylmer Martin prepared the case from our point of view in a very able manner. A Commission is now sitting and Mr. Martin, who has the whole subject at his fingers ends, was appointed our representative and has given his evidence. We have stood strong for standardization and are in favour of a metric system, and I hope that the labour of this Committee will prove satisfactory.

Cinchona.—Very few of us are largely interested in cinchona, but there still remains a certain acreage of this product. For years we have been trying to come to a working arrangement with Government that would be mutually advantageous to the cinchona planter and to the Government Cinchona Department.

Planters have always protested against the extension of the Government plantations and have urged that they were in a position to supply the requirements of the country under a guarantee. This is still true, but I fancy a sharp rise in the price of free bark is likely to see the last of our cinchona. Few men, considering the losses incurred in the past and the uncertainty of the future, will fail to realize on what they have if the price goes high.

I believe the department has been buying lately at the rate of 5 cents per half kilogram unit, which is equivalent to a little more than 9*s.* 10*d.* per lb. unit, and I see in last mail's market reports that the London price is fully 1¼*d.* per unit.

In regard to local matters I hope that the planters interested in the Kil-Kotagiri road will be able to contribute to the initial expenditure. The road is necessary to them but the whole expense of construction is too heavy for the District Board.

Taken as a whole I think the roads in the district have been efficiently maintained during the past year and in some cases they have certainly improved,

I think that those who live in Gudalur taluk might seriously consider whether it would not be to their advantage to have their road cess evened up to the rate that is in force in the rest of the district.

I understand that the Telegraph line will be very shortly extended to the Kullukamby district. This has been a crying need for some years.

Before sitting down, gentlemen, I must thank you for the honour you have done me in electing me your first Chairman and I should also like to express, on your behalf as well as my own, our thanks to Mr. Nicolls for all the work he has done for us. The office of Honorary Secretary of the N. P. A. is no sinecure as I know from experience. It entails a lot of work and Mr. Nicolls has given us the benefit of his energy in instilling new life into our proceedings. I would ask you gentlemen to make your secretary's work as easy as possible. Poorly attended meetings and unanswered circulars are very disheartening. The yearly increasing balance for the last ten years, although our acreage has decreased, are proof of the attention Mr. Nicolls has given to our business.

103. Labour Commission.—The Hon'ble Mr. E. F. Barber stated that at the last meeting he had given the main condition framed by Messrs. James Finlay and Co. By an oversight the full conditions had not been published but the executive committee were having them circulated to the Honorary Secretaries of all District P. A's. He then read them out to the meeting. He continued, that over 4,000 acres had come in since the last meeting and that Mr. Wapshare, who was in favour of the original proposal, would probably come in with his acreage. Others who were in favour of the scheme had referred the matter to their proprietors or directors at home. Information had been received that the Anamalais had come in *en bloc* and considerable acreages had been reported from other districts.

104. Delegates to the U. P. A. S. I.—The next business before the meeting was with reference to the election of Delegates to represent the Association at an Extraordinary General Meeting of the U. P. A. S. I., to be held at Bangalore in March. The meeting elected Messrs. L. L. Porter and C. H. Brock as Delegates.

165. Railway Freight on Tea Seed.—The Honorary Secretary read certain correspondence which was recorded.

106. International Rubber Exhibition.—The Honorary Secretary's answer to the effect that little or no rubber is grown on the Nilgiris was recorded.

107. The Kil-Kotagiri Road.—In this connection it was pointed out that the District Board Engineer's estimate for this road amounted to about Rs.34,000 and the President of the District Board to find this sum and planters interested had been asked to state what sum they were willing to contribute. Mr. Vernede stated he was willing to contribute Re.1 per

acre on 800 acres, while Mr. Deane stated that other estates interested were also willing to contribute at the same rate on 500 acres, which made a total of Rs.1,300. Mr. Barber remarked that it would be a mistake to approach Government with the statement that the estates concerned were only willing to contribute Rs.1,300. Mr. Deane enquired as to what other estates had contributed towards the Government roads they were served by, and pointed out that the sum might be increased by the contribution of Re. 1 per acre being extended over a period of several years. Mr. Porter stated that the cost of making the Droog road had been borne entirely by the estate interested.

Mr. Young pointed out that it was true that Government contributed towards trunk roads and that even if this could be treated as a trunk road there would yet be a sum of Rs.17,000 to be found by the Board as the Government would not contribute more than half the amount of the estimate. This sum the Board could not find and he wished to know if planters were able to contribute a minimum of Rs.15,000. Mr. Deane at this stage produced a letter from Mr. James Stanes in which the writer considered the estimate of Rs.34,000 ridiculous for less than 8 miles of road and considered that Rs.20,000 would be ample. Mr. Vernede pointed out that when Mr. Haldwell was District Board Engineer he had prepared estimates for this road which came to only Rs.17,000 and that such a road would be quite good enough for them. After some further discussion it was resolved that a Committee of Messrs: Deane, Vernede and Brock be appointed to meet the District Board Engineer with a view to reducing the estimated cost of the road.

108. Scientific Department.—Mr. Barber remarked that the Scientific Officer's term of five years would expire in May and the question of the continuance of Mr. Anstead's services and also that of the post of Scientific Officer was before Government. It was unanimously resolved at Bangalore that both should be continued. The question was still before Government and it was expected that the contribution of Rs.3,000 made to Government would possibly have to be increased to Rs.4,000. The U.P.A.S.I., would meet the additional Rs.1,000.

In this connection it was also pointed out that it was proposed to remove the Scientific Officers' Head Quarters to Coimbatore.

The meeting unanimously resolved to instruct its Delegates to vote for the retention of Mr. Anstead's services at an increased contribution if such be necessary, and left the question of the transfer of this Officer's headquarters to Coimbatore open.

109. Election of Office Bearers.—Voting papers having been filled in by members present, the result showed that Mr. Barber was re-elected Chairman, Mr. Porter, Vice-Chairman and Mr. Nicolls, Honorary Secretary. Mr. Barber thanked members for having re-elected him and proposed that Mr. Nicolls might be elected as Chairman and Mr. Church as Honorary Secretary as Mr. Barber was proceeding home. The meeting accepted this and the officers elected kindly consented to serve as such.

Votes of thanks to the Chair and to the Collector for the use of the room, terminated the proceedings.

Papers on Table:—*The Agricultural Journal of India*, Vol. VIII.
Do do do Vol. IX, Part I.
30th Report of the European Association.
List of Members, Do

LIME.

From the Quarterly Journal of the Scientific Department of the Indian Tea Association we are permitted by the courtesy of the Secretary to republish an interesting article on Lime that appeared in that journal.

The following are extracts from the article on Lime referred to above:—

At the present time considerable interest has been aroused in the use of lime as an adjunct to the cultivation of tea. Throughout the tea districts generally the application of lime has been followed by an improvement in the condition of the tea, and it may be as well to discuss briefly some of the causes that produce this effect. In this connection it may perhaps be interesting to note the questions that are continually being addressed to the Scientific Department, *e. g.* (*a*) What is its action upon the soil? (*b*) Does the soil in my garden need lime? (*c*) Does it result in exhaustion of the soil as a plant food store? (*d*) How much shall I apply? (*e*) How should it be applied? (*f*) When should it be applied? (*g*) In what form should it be applied?

A few of the principal effects of lime on the soil may be briefly stated as:—

(i) Its effect upon acidity

(ii) Its effect upon the decomposition of the soil particles.

(iii) The physical alteration produced in the soil agglutinates.

(iv) The variations brought about in the bacterial flora.

During the oxidation and decomposition of the organic and mineral compounds in the soil, acids are produced and in order to maintain fertility it is necessary to neutralise these, this can most conveniently be accomplished by the use of lime. A simple method of testing the soil for acidity, and one that can be carried out on any garden, is by means of blue litmus paper which possesses the property of becoming pink to a greater or less degree according to the quantity and nature of the acid present. A sample of the soil should be taken from just below the cultivation depth. This is put into a convenient vessel such as a wine-glass. A piece of litmus paper is placed in the glass with the soil, and the latter gently pressed down and moistened if dry. The paper is then allowed to remain in the soil for 10 minutes, when its colour is compared with a piece of damp litmus paper that has not been in contact with the soil. If a change in colour is noticeable the soil is acid. Such change of colour may be but slight since litmus paper is only feebly affected by many of the soil acids.

A. D. Hall, in his book entitled "Fertilisers and Manures" lays down as a guide to the necessity for the application of lime that a soil containing less than 1 per cent. of Carbonate of lime will benefit by its application, and that to a soil containing less than 0·2 per cent. the addition of lime becomes a necessity. Judged by this standard almost all soils in the tea districts of North-East India are in urgent need of lime since little or no carbonate of lime exists in the soil. Lime is not the only substance that has the property of neutralising acidity. Soda, Potash, etc., also possess the same property.

The soil particles consist of complex, chemical compounds which are only very slowly decomposed and rendered soluble by weathering. Such compounds often contain considerable quantities of potash and phosphoric acid, which are necessary to the healthy development of plant life and these

being in an insoluble state cannot be utilised as food by plants since they can obtain their food only when in solution. The effect of lime on such particles is to decompose them and render some of the stored-up food substances soluble. In the soil of the tea districts of North-East India considerable quantities of both potash and phosphoric acid are thus stored and a judicious use of lime will hence liberate food to supply the needs of the growing plant. The following figures obtained from analyses of various tea soils clearly demonstrate this :—

	Soluble, difficulty.	Insoluble or Soluble.
	Per cent.	Per cent.
Potash	0·006	0·233
,, ...	0·008	0·370
,, ...	0·007	0·310
Phosphoric acid	0·007	0·084
,, ...	0·007	0·130
,, ...	0·008	0·105

The terms "soluble" and "insoluble or difficultly soluble" refer to the condition of the substance in the soil, and these figures show that large quantities of food material are stored in the soil. The effect of lime is also to be observed in the change in size of the soil particles. In heavy soils, and these are heavy because they consist largely of small particles, it is desirable to make the small particles conglomerate with each other and so produce compound larger particles known as agglutinates. This results in a larger space between particles for air and water and also allows of a more rapid movement of the water and better drainage. Not only does lime produce the above changes but it so modifies the conditions in the soil that a considerable change in the number and varieties of the micro-organisms results.

A paper has recently been published by H. B. Hutchison of the Rothamsted Experimental Station in the *Journal of Agricultural Science*, Vol. V, Part III, dealing with the effect of lime in the caustic state upon the micro-organic flora and fauna of the soil. In this paper the author attempts to show the effect produced by different forms of lime, this is, as burnt or caustic lime, and as carbonate of lime, or crushed limestone or chalk. In the first place it is to be noted in the case of soils containing a sufficiency of carbonate of lime, that a further addition of carbonate or even a slight addition of caustic lime has no further effect, a large addition of caustic lime has a marked effect upon the fertility.

Experiments clearly show that caustic lime has a different action in the soil from carbonate of lime (crushed limestone). The above quantities of lime correspond approximately to 0·6, 3·3 and 6·6 tons per acre calculated on the top six inches of the soil, which in England is the effective depth so far as the numbers of bacteria are concerned. 0·1 per cent. lime corresponds with about I ton of lime per acre calculated on the top nine inches of soil. The question then arises as to the difference between the action of the caustic lime and of the carbonate of lime. It is a well-known fact that caustic lime when present in sufficient quantity can act as a disinfectant and it was thought that its action might be due in some degree to this property. Soil treated with mild antiseptics or subjected to high temperatures has been shown to result in increased fertility and this has been attributed by the author of the paper under discussion and Russell to the destruction or depression of the soil protozoa with a subsequent increase in bacterial

growth. Caustic being also a mild antiseptic should then act in a similar manner and cause the destruction of protozoa. It is, however, necessary after the antispetic action has taken place the substance used should be either removed or rendered innocuous. In the case of toluene and choloroform this can be done by volatilisation. The lime, however, is rendered innocuous by becoming converted in the soil to carbonate of lime which possesses no antiseptic property. Experiments were conducted to determine the power of caustic lime to destroy protozoa and it was found that 0·5 per cent. caused the destruction of certain kinds whilst others were more resistant. It at once becomes evident from a study of experimental results published that the destruction of such protozoa is coincident with an increase of bacterial growth and the production of increased quantities of Ammonia and Nitrates. It is to be noted that in those cases where but comparatively small doses of lime were applied the increase in the number of bacteria and the quantity of Ammonia or Nitrates produced was but small and in some cases showed practically no increase over the untreated soil. Larger quantities of 0·5 per cent. and 1·0 per cent. produced a marked effect but the increase did not take place immediately, a depression not only of the protozoa but also of the bacteria taking place at first. The larger the quantity of lime used the greater was this depression.

Caustic lime has a pronounced effect in disturbing or even destroying the normal state of equilibrium existing between the micro flora and micro fauna of the soil. This effect is not obtained by mild lime (carbonate of lime, *e g.*, crushed limestone). The action of caustic lime is intermediate between that of volatile antiseptics and high temperatures. In addition to killing many bacteria and protozoa it decomposes the nitrogenous organic matters in the soil producing substances that act as food for the bacteria and subsequently become plant food. The depression of bacteria activity exists until all the caustic lime has been converted into carbonate. This period of depression is followed by one of great activity. The inhibitory action of caustic lime on soil bacteria is influenced by the soil and may possibly be governed by the organic matter present.

Having discussed the action of lime upon the soil it is necessary to consider whether soil exhaustion is a necessary corollary. Increased fertility of a soil without the addition of such plant foods as are utilised by the increased plant growth must of necessity result in a more rapid using of the plant food stored in the soil, because a greater amount has been grown and a larger quantity of food has been necessary to provide for the additional growth, for instance, a block of tea that has given a yield of 10 maunds instead of 5 maunds per acre must have used up more plant food, and if the additional quantity has not been supplied in the form of manure it must have been obtained from the soil. Such soil exhaustion is brought about not only by the use of lime, but by all means such as hoeing, trenching, draining, pruning, or whatever cause, apart from the addition of food stuff to the soil, results in an increased growth. The application of lime, however, may result in the more rapid destruction of the organic matter and in the production of large quantities of soluble potash and nitrogen compounds in excess of that required by the plant and these may be washed out of the soil and so lost. Such a use of lime is to be deprecated since it results in waste. Care and due attention to the application of manure in conjunction with lime must be exercised and only if this be done can beneficial effects result from the use of lime. The question then at once arises how much lime should be applied? This question cannot be answered by any definite statement. The require-

ments of any soil can only be approximately determined by a careful study of that soil but it may be of interest to note that light soils do not as a rule require as much lime as heavy soils. It has been found necessary to apply as much as 15 maunds per acre of burnt lime to soils consisting largely of fine sand and silt and a markedly beneficial effect was experienced in a garden in the Dooars by the application of 1 ton per acre. It is of importance to add the required quantity since if small and insufficient quantities are employed but little effect may be noticed, and that not proportional to the cost entailed. In some cases even no result will be seen and this may lead, as it has done already in some tea districts, to the conclusion, that lime is not required. This is an entirely erroneous conclusion, but one that has been reached through an improper use of lime.

The time to supply lime cannot be definitely laid down except to say that it should be applied to land that requires it whenever and as soon as possible. It is usual to add it in the cold weather and to turn it in with the deep hoe, which ensures a more thorough admixture with the soil.

In what form should lime be applied? The choice of the particular form in which to apply lime must be dependent upon several factors. It has already been pointed out that as a partial sterilising agent for the destruction of protozoa it is necessary to employ Caustic lime. This, however, is not a necessity in order to neutralise the soil acidity, nor to improve the physical texture nor to render the potash soluble. Such effects can be obtained by the use of carbonate of lime. The use of the more soluble caustic lime results however in a more rapid rectification of the soil conditions and since this an urgent necessity in many cases it would appear advisable to employ the more soluble caustic lime at first. The use of caustic lime, as has been already pointed out, may result in a rapid oxidation and consequent loss of organic matter, and when it is remembered that the soils in the tea districts of North East India, in a majority of cases contain this in insufficient quantity, a very definite reason for not using caustic lime is established. Since then there are objections to be raised to the use of either form. It is necessary to endeavour to obtain some method for the applications which shall, to some extent, at least, remove these objections. This it would seem possible to do by a first application of Caustic lime, in order to improve the soil conditions as quickly as possible, and subsequent applications might take the form of carbonate of lime. This will be slower in action but will not result in the oxidation of organic matter nor will it so quickly render potash soluble. Carbonate of lime can be obtained as limestone. The rapidity of its action will depend upon its composition and also upon the fineness of grinding. The chemical composition of some limestones is such that solution takes place in soil water more slowly than with others. The more finely the stone is ground the more rapidly will it effect the soil.

Lime can be obtained in three distinct forms:—

(*a*) Unslaked lime.

(*b*) Water-slaked lime.

(*c*) Crushed limestone (Carbonate of lime.

These forms represent different chemical compounds, the first may be regarded as actual lime. The second is actual lime plus a certain quantity of water used in slaking. It therefore contains a smaller percentage of actual lime than unslaked lime. The last of the series is a chemical compound formed by the combination of unslaked lime with carbon dioxide.

It therefore contains a smaller percentage of lime than does unslaked lime. Pure unslaked lime contains 100 per cent. of lime whereas water-slaked lime contains 75 per cent. of lime and Carbonate of lime 56 per cent. of lime. To state this in another way, 56 parts of unslaked lime will correspond with 75 parts of water-slaked lime or 100 parts of carbonate of lime or for practical purposes one part of unslaked lime corresponds with $1\frac{1}{2}$ parts of water-slaked lime or 2 parts of carbonate of lime. If it is desired to substitute one form of lime for another then an alteration in the quantity employed must be made according to the above ratios.

In view of the above statement it at once becomes obvious that the different forms of lime possess a different monetary value depending upon the quantity of actual lime present, for instance, if unslaked lime is valued at Rs.2 per maund, then 107 lbs. of water-slaked lime containing 75 per cent. lime should cost Rs.2, since this will contain the same amount of actual lime as one maund of unslaked lime. One maund of water-slaked lime will cost therefore Re.1-8.

Since crushed limestone contains no more then 50 per cent. of its weight of actual lime, 2 maunds will therefore be valued at Rs.2 or one maund at Re.1. The above relative quantities are calculated for pure materials if an impure limestone were to employed, then its relative value would be diminished.

The 'Gootee' Method of Propagation.

Although the process for propagating plants described below has been employed for ages in India and for a considerable period of time in Australia, there seems to be no harm in calling attention to the operation for the benefit of those readers in the West Indies who may not be familiar with the subject. The information has been obtained from the *Queensland Agricultural Journal* (November 1913), though the original source seems to have been the *Tropical Agriculturist* of Ceylon.

The 'gootee' mode of propagating plants is adopted in the case of trees which are difficult to raise by layering, or which seldom set seed, and also as a means of increasing any tree of special merit, or a part of a tree exhibiting a variation which it is desirable to perpetuate. It is often of special value in the propagation of fruit trees, where it is desired to obtain early-bearing plants. In carrying out the operation, it is necessary to select a firm and healthy branch with well-ripened wood immediately under a leaf bud or node: Take off a small rim of bark about 1 inch wide. To this apply a ball of clay soil, holding it securely together with coir fibre, tow or moss, and bandaging all firmly round the branch.

A little above this is hung a pot, and through the hole in the bottom of this vessel a piece of rope is introduced and a knot is tied at the end of the rope, which should fit tightly against the hole when the rope is drawn through. The cord thus secured by its knotted end in the pot, is carried on at full stretch and coiled round the 'gootee.' By this arrangement the water, with which the pot is kept supplied, oozes slowly out, trickles down the rope and along the coil and so distributes itself over the whole 'gootee.' After three or four months young roots should be seen protruding through the binding. At this stage the branch may be cut from the parent tree, and planted where it is intended it should remain. The operation may be carried out best in wet weather, commencing as soon as active growth in the tree begins.—*The Agricultural News.*

SPECIAL GENERAL MEETING.

A Special General Meeting of the United Planters' Association of Southern India was held at their Offices, 25, South Parade, Bangalore, on the 11th and 12th March, 1914. Mr. J. G. Hamilton presided in the unavoidable absence of the Chairman, Mr. E. L. Mahon. The following Delegates from the various Planters' Associations were present :—

Messrs. Robinson (Anamalais), Boyd and Kirwan (Bababudins), Richardson and Prince (Central Travancore), Graham and Mann (Coorg), Martin (Kanan Devan), Porter and Brock (Nilgiris), Reed (North Mysore), Turner (Shevaroys), C. Lake and Hayward (S. Mysore). Richardson (S. Travancore) and Abbott (Wynaad). The Hon'ble Mr. Barber and Mr. Nicolls, Members of the Labour Committee, and Mr. Malcolm, ex-Vice-Chairman; Messrs. Pascoe, Church, and B. A, Marden were present as visitors; Mr. Fletcher Norton, Secretary and Mr. R. D. Anstead, Scientific Officer.

The following resolutions were passed :--

Memo of Resolutions.

(1,) "That this Meeting do approve and adopt the report of the Executive Labour Committee."—Carried unanimously.

(2.) "That the Association agrees that the recommendation of the Executive Committee be accepted that the Labour Department be started on an approximate acreage of 100,000 acres at Rs.2 per acre per annum for 5 years."—Carried unanimously.

(3). "That the condition regarding advance be accepted."—Carried unanimously.

(4). "That condition No. 3 regarding the Executive Committee be accepted."—Carried *nem con.* (Mr. Richardson did not vote except as Chairman, and wished it to be recorded that he could not vote for his Association.)

(5) "That condition No. 4 relating to superintendence of the Department be adopted by the meeting".—Carried unanimously.

(6) "That condition No. 5 relating to the Company's Office Staff and Agencies be adopted".—Carried unanimously.

(7) "That condition No. 6 relating to the Company's motor car be adopted".—Carried unanimously.

(8) "That condition No. 7 regarding buildings be agreed to."—Carried unanimously.

(9) "That at the end of five years should the Company be of opinion that the working of the Department has not been satisfactory, they shall be at liberty to withdraw from it altogether, with their staff."—Carried unanimously.

(10) "That this meeting endorses para. No. 9 setting forth Messrs. Finlay and Co's views as to the requirements of the Department." Carried unanimously

(11) "That the Labour Department be started as from the 1st July, 1914, and subscriptions be started as from that date, and be collected

quarterly in advance at the rate of 8 annas per acre per quarter."—Carried unanimously.

(12.) "That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."—Carried unanimously.

(13.) "That the increase of acreage joining the Department be published in the *Chronicle* every week until 1st July."—Carried unanimously.

(14). "That this meeting wishes to express its grateful appreciation of the unselfish labours of the Executive Committee and accord them a most hearty vote of thanks."—Carried by acclamation,

(15). "That in the opinion of this meeting though the control of the Department must remain with the U. P. A. S. I., it would be advisable that non-members who subscribe to the Labour Department should be given some opportunity of expressing their views and suggest that representation on District Advisory Committees would meet their case, when the acreage involved warrants such representation".—Carried unanimously.

(16) Mr. C. E. Abbott proposed a vote of thanks to Messrs. James Finlay and Co. and Mr. Richardson for placing their Labour Organizations at the disposal of the U. P. A. S. I., making the starting of a Labour Department of their own possible".—Carried by acclamation.

(17.) "That in view of the Labour Department starting from 1st July, 1914, the Annual General Meeting of the U.P.A.S.I. be held as early in July as possible."—Carried unanimously.

(18.) "That this meeting wish to bring to the notice of the Government of Madras that the stipulation made by the Mysore Durbar to continue the contribution of the Rs.1,000 per annum for 3 years, provided the Scientific Officer will assist the local Indian planters with his advice is unreasonable, and would point out that the Scientific Officer could not afford the time to visit and advise Indian planters, whose holdings in the State amount to 107,000 acres of coffee as compared with the 22,000 acres supporting the Scientific Department of the U. P. A. S. I."—Carried *nem con.*

(19) "That the Government suggestion that a further sum of Rs. 1,036 to the Scientific Department be paid out of U. P. A. S. I. funds be agreed to."—Passed unanimously.

(20) "That Delegates refer the taking over of the Scientific Department by Government to their District Associations with a view to discussion at the Annual General Meeting in July."—Carried unanimously.

(21). "That this Association ask permission from Government to provide the Scientific Officer with a motor car on the instalment system".—Carried unanimously.

(22). "That the Secretary, U. P. A. S. I., do send our reply paid postcards to the members of the various Associations asking them how many copies of Mr. Anstead's book containing his contributions to the *Chronicle* they require—and that the Secretary should only wait 10 days or such replies."—Carried unanimously.

Special General Meeting of the U. P. A. S. I. on the Labour Department.

Overleaf we have published the resolutions that were passed at this meeting on the 11th and 12th instant which will require confirmation at the Annual General Meeting, which it was suggested should be held early in July, if the Chairman approves of it. The Meeting was very well attended, only two Associations were unavoidably unrepresented. In the absence of the Chairman, Mr. J. G. Hamilton was voted to the Chair, and presided over the Meeting which was opened by his reading a letter from Mr. Mahon, expressing his extreme regret that he was unable to be present and to preside, but acting on the stringent orders of his doctors he was quite unable to attend. Much sympathy was expressed at his absence and sincere wishes for his speedy and complete recovery expressed on all sides. An admirable letter on the establishment of a Labour Department was read from Mr. J. A. Harris, who is an ex-Chairman of the Association, from England, which elicited applause for its broad-mindedness, and for its appeal to all planters to lay aside all small differences and unite to form a Labour Department in a manner worthy of the United Planters' Association. From the resolutions it will be seen that the report of the Executive Committee and Messrs. James Finlay & Co's conditions were adopted unanimously. It was the adoption of these latter that formed the most important part of the discussion, and was the crux of the whole matter. An idea—an entirely false one—had got about that Messrs. Finlay & Co. would practically work and control the Labour Department and this idea which we are afraid would have gone far to wreck the scheme, was entirely removed from everyone's minds by the admirably clear statement of Mr. Aylmer Martin who conclusively proved to the assembled Delegates that so far from that being the case, if the conditions were accepted and approved of, that the Labour Department would become a Department of the U. P. A. controlled absolutely by it, and that Messrs. Finlay's representatives on the Executive Council only numbered two or a ratio of 1 to 3. I cannot too often and too urgently impress on the minds of every member of every District Association and to the subscribers to the scheme, that if started, the Labour Department becomes an integral part of the U. P. A., under its absolute control—and not responsible to any other person or body. I wish to fix this point and make it clear, and to reiterate it. The full report of the speeches at the meeting I hope to circulate to every member of every District within ten days, and I make an urgent appeal to every member to circulate the exact fact, and take it from me that the Labour Department is under the absolute control in the interim of the U.P.A. I make this appeal most urgently as most unfortunately the *Madras Mail* of the 12th published in its occasional notes that Messrs. Finlay & Co. would work (implying control) the Labour Department. Though the *Madras Mail* regretted on the 13th having made this error, I wish to efface the harm that may have been done by its previous statement and in this every member and subscriber to the scheme can help and *must* help.

I am sure that if Messrs. Finlay & Co. desired to control the Labour Department they would have made it one of the conditions. That they did not do so, but placed the whole of their organised Department at the disposal of the U. P. A.—an action which has drawn high expressions of admiration from District Associations and from this Meeting.

FLETCHER NORTON,
Secretary, U. P. A. S. I.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

100,000 acres are required to establish the Labour Department.

It has been decided to publish the increase of acreage joining it every week until July 1st.

On 14th March	....	....	67,587 acres had joined.
This week	....	....	1,024 ,,
Total to date....		....	68,611 acres.

"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

FUNGUS.

Diseases caused by Fungi.

By George Massee, F.L.S., V.M.H.

At the outset, it may be well to point out a few mistakes made by practical men, as to the particular way in which fungi do their work.

It is usual to hear the planter asserting, after the presence of the disease has become obvious, that up to a certain date the plants were quite healthy. This is generally a mistake. When the seed of any plant is sown, some considerable time is occupied in the formation of root, stem, leaves, etc., and in storing up food, before the fruit is produced. In a similar manner, when the spore of fungus falls on a leaf, say a Coffee leaf, it germinates on the surface of the leaf. The sprout enters into the tissues, and there forms a quantity of spawn or mycelium, obtaining its food from the leaf. In course of time, the leaf ceases to provide food for the fungus and the latter then bursts through the skin of the leaf and bears on its surface a crop of spores, which are scattered by wind, birds, insects, etc., and infect other leaves. In reality the leaf was diseased from the moment the sprout of the spore entered its tissues, although sometimes weeks passed before there was any outward sign of the presence of the parasite in those tissues.

This statement is true of hundreds of kinds of fungi that are parasitic on plants both wild and cultivated; in fact, it is true of all parasitic fungi, with the exception of a few mildews, of which the Hop mildew and Rose mildew are examples. Such being the case, it is quite obvious that the only way to guard against infection from the spores of fungi is to prevent their entrance into the leaf, and spraying with a fungicide is the only known method of accomplishing this object. We are quite well aware of the many practical difficulties standing in the way of spraying in the tropics—torrential rains, nature of the ground, labour, etc., yet in very many instances spraying could be practised with decidedly beneficial results.

Spraying is not a curative measure, for the reason given above, that the growing portion of the fungus is in the tissues of the leaf, and cannot be reached by the fungicide. What spraying will do, if applied in time, is to prevent the first infection of leaves, by covering the surface with a substance poisonous to the germinating spores.

To accomplish this object the disease should be anticipated; in other words, spraying should commence before the disease appears. An experienced planter will know at what particular season of the year infection is most likely to occur. When a disease is present, spraying will arrest its progress by destroying the spores that alight on the surface of the foliage.

Bordeaux mixture is perhaps, the best for spraying, and it can now be procured in the dry condition, ready for dissolving in water when required. As a rule, spraying is continued for too long a time. The moment the solution commences to drip from the foliage it is time to stop. Always commence with a solution containing more water than is prescribed in the directions given, and gradually decrease the amount of water until the leaves show injury. As some plants will bear a stronger solution than others, experience will be the great guide in such matters.

So far, we have been dealing with those fungi which attack the foliage and above-ground parts of plants by means of spores. We now come to consider a second group, which have a different and far more damaging

method of attack. To this second group below those fungi whose spawn or mycelium live in the humus and travel long distances in search of new plant roots, when the tree they have already attacked is dying from their ravages, and no longer supplies the required amount of food. The fungus produces its fruit on some above-ground portion of the dying tree, so that the spores may be carried by various agencies and infect other trees.

Although the fungi belonging to this group can reproduce themselves by spores, yet the most serious injury they do is by means of their mycelium which is usually in the form of white strands spreading in the ground in every direction a few inches below the surface. To this group belong the large bracket-like fungi, the large agarics, or toadstools, as well as many minute or microscopic kinds. Stumps left in the ground, as is well known, are centres of infection from which mycelium spreads in the soil in every direction. The most effective means, therefore, of checking the spread of mycelium would be to remove all stumps. This, however, for various reasons cannot be done, at least not at once. As the strands of mycelium extend through the soil, growth takes place only at the tip, the back portion dying away. The tip or growing point consequently requires food at every stage of its progress. If such food is withheld it dies at once. This knowledge affords a means of checking the spread of mycelium in the soil by means of open trenches. Such trenches need not be more than a foot wide, and about a foot in depth. If an open trench of this description was made round every stump, the spread of mycelium from such infected centres would be practically arrested. Similar open trenches breaking up the entire portion planted into small areas would also go far towards checking the underground spread of fungi, which cause far more injury to cultivated plants in the virgin forest than is usually realised. Of course, as in the case of spraying, the difficulty of keeping open trenches in the tropics would be serious in many localities, yet it is well to know how to apply the only practical remedy against ground fungi.

Almost invariably the first symptom shown by a plant whose root is attacked by a fungus, is a reduction in the amount of foliage, and also a more or less marked reduction in the size of the individual leaves which wilt and fall early and the tree dies. Of course, the time elapsing before a tree is killed by a root fungus varies according to the intensity of the attack. To make certain that a fungus is present in the root, or collar, remove a portion of bark from either of these parts, and the presence of mycelium, usually white in colour, proves that the injury is caused by a fungus. The mycelium of the fungus gradually spreads in the tissue of the root and collar, and ultimately chokes up the water-conducting system of the tree, thus but little water can ascend from the root into the leaves, which, therefore, wilt, and the plant is practically starved to death.—*Planting in Uganda.*

Cost of Producing Rubber in the F. M. S.

The F M. S. have been compelled to adopt a policy, though not exactly of a cheese-paring character, to keep down the high cost of producing rubber. The means adopted have been a reduction of salaries all round, from the labourer up to the Superintendent. The cost at which rubber is produced now in the F. M. S. compares very favourably with Ceylon. The ex-Chairman of the Rubber Growers' Association, Mr. A. Bethune, who has expressed this opinion, was also inclined to think that greater progress had been made out there by the Rubber Chemists.—*Ceylon Observer.*

COOLIE WAGES

A London View.

The views which have been set forth in "Grenier's Rubber News" on the subject of the reduction of coolies' wages have apparently attracted the attention in London they undoubtedly deserve. Chairmen of Companies who, two or three years ago, were talking wildly of fat dividends in prospect even with rubber at half a crown, are now talking almost as wildly of economies which are not to keep up dividends but to enable them to avoid deficits. Among these economies are estate salaries and wages. We seldom hear anything of London charges and fees. With their accustomed grip or lack of grip, of essential conditions, directors in the main with rare exceptions seem anxious only to take the very heart out of the goose which lays whatever golden eggs there may be. This haste to cut down coolies' wages is a little unkind and wholly undignified. It shows that directors have got the funks and are prepared to penalise anybody but those really responsible for the economic conditions. If the Rubber planting industry has entered upon a long period of depression, if, that is, it were found that reasonable profits were not again to be looked for without the most drastic measures in every direction, there would be good ground for informing the coolies that they could not permanently expect their present rate of pay. What some of the directors forget is that the coolies were recruited on terms which have been modified without the right of appeal, and that, in so doing, the good faith of the white man, the most precious thing he possesses among natives, has come very near being broken. If coolies are allowed to think for one moment that they have been taken from home on false pretences, we shall have a scandal of the first order, and the prejudice of all future attempts to enlist his services must be the unfortunate consequence. That at any rate is the view taken by the people at home who do not look at things wholly through the directors' spectacles. It is not merely the sentimental view of Fair Play and Common Sense, and as such opposed to what I can only call the coldly calculating and callous directorial view.

Sir Ernest Birch tells us that the reduction of wages would not have been so complacently accepted if the labour conditions in the F. M. S. were not becoming easier. That is surely not the point which should be considered just now. The question of supply and demand was not discussed with the coolie when he was engaged. It was not told that he would be paid, for him, a high wage because the labour was scarce, and that if it suddenly became plentiful his reward would be reduced. There is one field of enterprise which is certainly heavily over-supplied with labour and labour that is quite adequately if not handsomely over-paid—the boards of rubber companies. Directors in unnecessary numbers were appointed at first class fees in boom time. The thinning out of some of the plants in London offices would be a useful beginning in economy. Any suggestion that a director can be well dispensed with or that fees should be reduced is at once treated as heroic if not revolutionary. I confess it almost turns one into a Socialist to hear over-paid directors waxing eloquent on the importance of cutting down estate charges and reducing the wages of coolies to whom every cent means so much. Never perhaps was a more extraordinary speech delivered than that of Sir Frank Swettenham at the Lumut meeting. Planters, he pointed out, put up the rate of coolies' wages when they were tumbling over each other to secure labour from any country: the method was reckless largely because of the madness of London which was determined to have a picking in the Mid-East pie at a time when, as Wicherley has said, a few old rubber trees were worth a King's ransom.

What the planters did in a mad time they are entitled to undo in a time of sanity. They engaged coolies at a certain wage when rubber was 10*s.* or 12*s.* per lb., now it is 2*s.* or 2/6*d.* per lb. they are to punish the coolie.

Let there be no mistake about the meaning of this letter; the reduction of coolies' wages may become a vital economic necessity. There is no evidence that such a stage has been reached, but the stage *was* long since reached when *other* vital economic necessities should have been faced in London. They were absolutely avoided. It is unfortunately true that dividends have had to be reduced and in some cases passed altogether. I venture to think that the excess of coolies' wages was not the main explanation of the inability of the Companies to produce at a good profit when rubber prices averaged as they did over 1913 more than 3*s.* per lb. The coolie like everyone else will have to bow to the laws of supply and demand. So far as I can gather on this side there is no falling off in the demand any more than there is in regard to rubber itself. If the precipitate reduction in wages resulted in a shortage of labour, what would happen then. Wages would go higher than ever.—*Grenier's Rubber News.*

QUEENSLAND.

Regulation of Sale of Pure Seeds for Planting or Sowing.—A copy of "The Pure Seeds Act of 1913" (No. 30 of 1913) has been received, which was assented to on the 27th November last, and which regulates the sale of pure seeds for planting or sowing in the State of Queensland.

The Act, which operates from the 1st January, 1914, provides *inter alia*, that the proportion or amount of foreign ingredients which may be contained in any quantity of any kind of seeds, and the character of such foreign ingredients, may be prescribed.

Upon the sale of any seeds of the value of not less than 1*s.*, the vendor shall, at the time of sale, give or send to the purchaser an invoice containing the statements required by the Act.

Every invoice, agreement, circular or advertisement relating to seeds shall state specifically that such seeds are for planting or sowing, and the kind or kinds of seeds therein referred to. Such statement in any such invoice, &c., shall, notwithstanding any agreement to the contrary, constitute a warrant by the vendor that such seeds are for planting or sowing, and are of the kind or kinds so specified, and, further, that they contain no greater proportion or amount of foreign ingredients than is prescribed.

When seeds are sold in made-up parcels, the year in which such seeds were grown shall be clearly and indelibly marked upon the outside of each parcel—provided that this provision shall not come into operation until the 1st January, 1915.

Provision is also made for the appointment of Inspectors, the taking of samples for examination, penalties and other matters for the purpose of carrying out the provisions of the Act.

The Act defines "foreign ingredients" to mean and include dead, diseased, insect-infested or non-germinable seeds: the term also includes seeds of any plants which the Governor-in-Council has, by Order-in-Council, declared to be noxious plants for the purposes of this Act.—*The Board of Trade Journal.*

TEA.

A Speech by Dr. Hope.

EXTRACTED FROM THE PROCEEDINGS OF THE GENERAL MEETING OF THE INDIAN TEA ASSOCIATION.

Dr. G. D. Hope said :—Mr. Chairman and Gentlemen,—In March last year I left India on home leave and during my absence the work of the Scientific Department was supervised by Mr. Carpenter, the Assistant Scientific Officer. As before, the Entomological and Mycological branches of the department have been under the control of Mr. Andrews and Mr. Tunstall respectively.

I was not present at the General Meeting of your Association last year and it is, therefore, two years since I addressed you. During that interval, as you know, a great deal of the work of the officers of the Scientific Department has been in connection with the construction and arranging of the new Experimental Station at Tocklai in Assam. I have recently paid a visit to the station and I can assure you that great progress has been made since I saw it last, and everybody who has seen it recently considers it to be a thoroughly well-equipped and very conveniently situated Experimental Station. I will not take up your time in going into the details of the arrangements which have been made there because this has already been dealt with fully in the report of the General Committee of the past year.

I have to-day to refer shortly to the general trend of our work of encouraging scientific methods in tea culture, and that I am able to do so in a rather broader way than would have been possible a year ago, is due to the kindness of your out-going Committee in having permitted me to spend some two and a half months after the expiration of my home leave last year, in visiting three other tea-growing countries namely, Java, Sumatra and Ceylon.

One is tempted after visiting these countries to draw a comparison as to whether they or we are working on more up-to-date lines, but, what is, after all, of greater practical importance is to determine in how far it is necessary for us to improve our methods. I am more strongly than ever of opinion that more intensive treatment of our estates in every way is necessary, in order to compensate for the relatively poorer soils and adverse climatic conditions, which obtain in many of our tea districts, and to compensate also for the more drastic way in which we pluck and prune our tea.

It is a significant fact that on tea estates in Java, Sumatra and Ceylon pests and blights do very much less damage, and occur less frequently, than in North-East India. I put this down to the fact that the health of the bushes of the tea gardens in these countries is, generally speaking, better than with us. This is due partly to the soil and climatic conditions, partly to the much less severe treatment of the bushes in plucking and pruning, and, in Ceylon, to the very heavy manuring of tea estates. It is necessary for us to aim at giving to our bushes the best possible tone, and in order to do so our methods must become more intensive.

Wherever agriculture assumes an intensive form, manuring plays a great part, and I am firmly convinced that manuring is going to become a factor of very great importance in the treatment of the tea gardens in North-East India. It will, therefore, be in greater measure than hitherto, a care of this

department to encourage the use of manures and to advise in this matter so that the best results may be obtained for money expended. This work has already become considerable, and I am pleased to be able to say that highly successful results have followed from many of the recommendations which we have made. As an example of this I would remind you that more than a couple of years ago we announced that good results were to be expected in many cases from the application to tea soils of lime in one or other form. The extent of the recent increase in the total consumption of lime for manurial purposes on tea estates since we brought this matter to notice, is in itself an indication of the value of this recommendation.

I regret that another matter to which notice has been drawn repeatedly, both in the publications of the department, and by the officers when they have been on tour—the great necessity of growing green crops in order to obtain and improve the tilth of the soil—has received comparatively little attention.

Assuming however that our garden work continues to become more and more intensive in all possible directions, I anticipate that when by this means the health and vigour of plucking bushes has been brought to the highest pitch obtainable, our estates will suffer much less than they do at present, from damage from pests and blights.

But though the more intensive treatment of our tea is a matter of primary importance, it is after all, an *indirect* means of combating pests and blights, and I do not wish to convey the impression that the study of *direct* methods of dealing with these problems is being neglected. During the past year the Entomologist and Mycologist have continued the investigation of mosquito and blister blights respectively. The scientific study of these two scourges has been made with the primary object of determining at what stage of their life histories, and at what season of the year, they are most vulnerable. This work has been carried so far that attention can now be turned to devising practical methods for their control, and these officers are now devoting themselves to this matter.

In conclusion, Gentlemen, I wish to refer shortly to the question of touring. It is a matter of regret to the officers of the department that complaints have frequently been received from the tea districts to the effect that they do not tour sufficiently. Nobody I think appreciates more the value of touring as a means both of educating ourselves and enabling us to get into touch with planters than do the Officers of the Department, but, as you know, the geography of the tea districts, and the conditions of travel in them, make it very difficult to get from place to place quickly and this handicaps the work of touring considerably.

The endeavour is now being made in arranging for future work to enable the Chief and Assistant Scientific Officers to do more touring than has hitherto been possible.

I would ask you, however, to remember that the ultimate value of the department to the industry must depend upon research work, and for this reason research should always occupy the foremost position in the programme of a Department such as ours. *(Applause).—Indian Tea Association Proceedings of the thirty-third Annual General Meeting of Members.*

CORRESPONDENCE.

Lymington, 19th February, 1914.

The Proposed Labour Department.

FLETCHER NORTON, ESQ.,

Editor, *Planters' Chronicle.*

Dear Sir,—Some five or six years ago, at a meeting of my District Association, I advocated the formation of a Labour Agency. The idea received considerable support, was ventilated throughout the district, but took no practical shape. Since then there have been great developments and the need of a Labour organisation of some description has been tremendously accentuated; so much so that a large majority seem to be in favour of it. Unfortunately they are divided into two camps, the one advocating a big scheme on broad and generous lines and the other a smaller and more tentative effort with a view to eventually building up a permanent structure. There is, as the Hon'ble Mr. Barber said in his admirable speeches at the N. P. A. Meeting a good deal to be said in favour of the views of the latter and I confess that I was disposed to side with them. Recent developments have, however, quite knocked the bottom out of their contentions and will, I feel convinced, induce many to go over to the other side. I allude especially (1) to the increased efforts Ceylon are making to lay their grasp on our labour preserves (2) to the increased offer of Messrs. James Finlay & Co., to place their organisation at our disposal.

Ceylon has for many years looked to India for its labour supplies but it is only since the Rubber boom that their competition has been so keenly felt. It is of little use to bewail lost opportunities, but there is no doubt if we had tackled the question six or seven years ago, started a Labour Department then on the more moderate lines that some are now proposing, we should be in a very different position. Fortunately in one district there were those who were sufficiently far seeing to realise the magnitude that this competition was likely to reach and to start a Labour Agency of their own, which under Mr. Aylmer Martin's guidance has I understand been a great success. And more fortunately still this organisation, the result of years of work is now, under certain conditions, offered to us. These conditions as far as I can judge present no insuperable difficulties but will no doubt require careful scrutiny.

By this offer the chief objections to the proposals of the Labour Committee (which I take it was that a scheme would not be started on such a big scale without previous experience) has been overcome. Let us then examine what remains to which exception is taken—As far as I can gather they are (1) That the proposed Labour Department would not undertake recruiting. (2) That Rs.2 an acre is too heavy a charge. With regard to the first it is quite consistent to object to the proposals of the Labour Committee on the grounds that they are too vast to start without previous experience, and then to complain that recruiting coolies is not included in their programme, no machinery for conducting which is in existence. If recruiting were added to the functions of the proposed new Department, its work, its responsibilities would indeed be on such a scale as at present, at any rate, to frighten the boldest. Perhaps in the future it may be found, when the Department shall be in thorough working order, that some development in this direction may be possible. But surely a study of the outline of work as detailed by the Hon'ble Mr. Barber that it is proposed shall be undertaken, is sufficient to convince any one that if this programme is effi-

ciently carried out the benefits to the employers of labour will be cheaply obtained at the rate of Rs. 2 per acre.

I, who am a convert to the idea of a big scheme, make an appeal, to those who, while in favour of something being done, have not so far been able to reconcile themselves to the views of the Labour Committee. I ask them to pause for a while and calmly review the situation from a broad stand-point. I ask them to consider whether the Planting Community of S. India is not now face to face with the biggest problem that has ever been before it, which if not wisely dealt with may cause widespread disaster. I ask them to consider whether a golden opportunity for dealing with it is not now presented to them, made possible by the unique offer of Messrs. James Finlay & Co., and by the patient self-denying work of the Labour Committee which, be it noted, would for the most part be thrown away should we not avail ourselves of the present favourable circumstances. If they answer in the affirmative, I appeal to them to sink all minor differences, such as may be involved in the relative rates the respective products shall subscribe, leaving them to be adjusted later on when the new department shall have found its legs and be in a position to adjudicate upon them. Let us then fall into rank and working shoulder to shoulder accomplish this work from which we shall derive more benefits than from any other achievement in the history of our industry. The United Planters' Association of Southern India was created by the need of reform in our Labour laws. That was the tie that in the first place drew together the widely scattered parts. It may be that now there is a tendency towards cleavage and that some fresh bond is wanted to strengthen our union. Nothing could more effectually accomplish this than the bringing of this labour protection discussion to a successful issue. The U. P. A. S. I. would be established on a firmer basis than ever before and more important still, everyone interested in our Industry, Europeans and Natives, Employers and Employed would most assuredly reap great benefits.

Your faithfully,

J. A. HARRIS.

12th March, 1914.

Duties of a Field Maistry.

THE EDITOR,

The Planters' Chronicle.

Dear Sir,—Do let us coffee planters who live in darkness have some more hints from "Nab."

There can be no doubt "Nab" has hit on the *only* way to get good field maistry work—Measure (but why not use a chain and Theodolite as we do) and then go away for the day, but if necessary, find the cool of the evening, and walk over your dug land for gentle exercise.

Ardent planters in these parts have an instrument, or should I call it a Tool something like Skies which they appear to find useful— this, if made heavy enough, is a great acquisition in walking on the hill sides and by prodding the land the oftener the better, you find all the weak spots in your coolies' work and your own constitution.

I know a property too, where each acre is marked with 4 furlong stones, whitewashed, and placed one at each corner. This should be of assistance —permanently to your correspondent, and might be enlarged on, the stones on each acre numbered and so on.

Then again I've known a Survey with the roads marked at 6 annas an acre save a lot of trouble, when you take the Field armed with your map in a long tin case. It is like having your maistry's head in Chancery undoubtedly a strong position.

No doubt to get the best results, the Planter needs his work made lighter.

Yours, etc.,
COFFEE.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—I have read "NAB'S" paper on the "Duties of a Field Maistry" in you issue of March 7th, with considerable amusement, tempered with a sigh of regret for my vanished salad days.

When the ordinary planter (by 'ordinary' I mean the planter who has been taught by experience the unwisdom of trying to paint the lily) gives his coolies a weeding or a digging task, or any other task which involves the covering of a specified area, he starts them in a line ("Nab's" "Base line"), and then—knowing the distance apart at which his trees are planted he can see, "when he takes his stroll in the cool of the evening," whether the allotted task has or has not been performed by simply counting the trees. He therefore achieves "Nab's" result, without "Nab's" elaborate paraphernalia of ropes and poles and the rest of it.

"Nab," I take it, is a novice who has not yet outgrown the 'fine but ineffectual fire of youth'—*hein* ? Happy "Nab!"

"NIB."

Glendale Tea Estate,
Hulikal (Nilgiris) 24th February, 1914.

Tea Yields.

THE EDITOR,
Planters' Chronicle.

Sir,—The figures given by Mr. Beaver in your impression of the 24th January, are quite correct, as I have just compared them with the receipts here. The total for the 12 months ending 31st December, 1913, is 28,397 which shows a yield of 141 *lbs. per acre. No leaf was received in April, probably on account of a prune. This for a field planted in December 1910, would make age of field 3 years from planting, and practically 4 years from seed.

A field of 3 acres, planted by me about 1,500 feet higher, just a year before, gave 216 lbs. per acre for year to the 30th June, 1913, which for comparison with above, should be called 3 years and 6 months from planting and 4 years and 6 months from seed.

Mr. Beaver's field is in a fine hollow, quite sheltered from wind, soil on the average superior to my field.

The size of some of the bushes as stated by Mr. Beaver is correct and altogether the field looks like old well established tea. It was a revelation to me on my visit to it.

Yours faithfully,
THOMAS BROWN.

*162 lbs. per acre shown by Mr. Beaver is a bit misleading, for it is you will notice the produce of 16 months, not only a year.—T. B.

Haileyburia Estate,
Peermade, 7th March 1914.

Tea Yields.

THE EDITOR,

The Planters' Chronicle.

Dear Sir,—I have read with interest the letters of Mr. Phil. Beaver and Mr. H. B. Kirk, giving yields of young tea.

A clearing of 83·15 acres was planted here in June—July, 1910. This clearing was cut down in December, 1911 and January, 1912. It was left to grow up to two feet, and then broken back and tipped at 18". I started tipping the same the last week of August, 1912. and give below the yields from that month to the end of December, 1913.

1912	August	...	290
,,	September	...	3,090
,,	October	...	2,670
,,	November	...	4,696
,,	December	...	4,353
1913	January	...	4,539
,,	February	...	5,579
,,	March	...	4,558
,,	April	...	5,911
,,	May	...	14,508
,,	June	...	7,959
,,	July	...	9,898
,,	August	...	8,912
,,	September	...	13,907
,,	October	...	13,580
,,	November	...	15,240
,,	December	...	15,539
	Total	...	133,229 lbs. G. L.

This represents a yield of 400·56 lbs. of made Tea per acre, when the clearing was 3 years and six months from planting. The rainfall here in 1912 was 140 inches, and in 1913, 100 inches. The elevation is approximately 2,700—2,900 ft. above sea level.

Yours faithfully,

A. R. ST. GEORGE.

5th March, 1914.

Tea Yields.

THE EDITOR,

The Planters' Chronicle.

Dear Sir,—I have been reading these letters on the yield of tea with interest, and I wonder if Mr. Kirk or any other experienced gentleman would kindly enlighten me on the following points through the *Chronicle* —Would land (second rate jungle and grass) with an annual rainfall of 70 inches, elevation 4,000 feet, North eastern aspect, be fit for tea cultivation, and whether with or without shade ?

Also land (old coffee) rainfall 60 inches, elevation 2,500 to 3,000 feet, same aspect as above, with light silver oak shade do for tea ?

Anybody replying would greatly oblige

A NOVICE.

P.S.—Also the best jât to cultivate in such land.

Munderi Estate,
Pandalur, P. O.,
10th March, 1914.

Ground Nuts.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear, Sir,—I shall be much obliged if you or any of your readers can give me any information or refer me to any publication dealing with the cultivation of ground-nuts.

Yours faithfully,
N. A. S. BARNARD.

Note by the Planting Expert.

The following references will probably be found of use:—

The Cultivation, Preparation, and Utilisation of the Ground-nut	...Bulletin Imperial Institute,	IX. 4.
Pest of Ground-nut in Madras	...Agricultural Journal of India,	I. 2.p 170.
Ground-nut Leaf Miner ...	do	II. 3.p 292.
Ground-nut Leaf disease ...	do	III. 2.p 171.
Experiments with Ground-nut in Bombay	do	VI. 3.p 293.
Tikka Disease of Ground-nut ...	do	IX. 1.
The Bambarra Ground-nut ...	do	VI. 2.p 172.
	Bulletin Imperial Institute,	IX. 4.p 399.

R. D. A.

REDUCTION OF RUBBER DOCK RATES.

In reference to representations made to them by the Rubber Growers' Association, the Port of London Authority have recently reconsidered the rates and charges on plantation rubber. In view of the fall in the price of the commodity, it was deemed desirable to make some concession to the trade, and revised rates, equivalent to a decrease of about 10 per cent. on the previous tariff, have accordingly been adopted experimentally for a period of twelve months. The new rates, which came into operation on January 1, last, compare as follows with those hitherto in force;—

	Present rates.	Revised rates.
Landing rate, per cwt. ...	... 6 *d.*)	
Reweighing, per cwt. ...	... 2½*d.*)	8 *d.*
Rehousing, per cwt. ...	... 2½*d.*	2 *d.*
Delivery to land conveyance per cwt.	... 3 *d*,	2½*d.*
Delivery to water conveyance	... 4½*d.*	4 *d.*

Modifications have also been made in the working charges of taring, sampling, coopering and inspection.—*The Rubber World.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 13.] MARCH 28, 1914. [PRICE As. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

Last week we published a full page giving the results of the amount of acreage subscribing to the Labour Department to 21st of March together with the resolution saying that unless one hundred thousand acres had subscribed by the 1st July, the scheme will have been considered to have failed. From this week we shall publish a Barometer which will tell at a glance from week to week the progress made.

Mr. Anstead, the Scientific Officer, left for England last week on a well earned holiday of six months. Letters received for him at the office as Planting Expert, will be opened by the Secretary and acknowledged. Should any of his correspondents specially wish their letters to be forwarded to him in England, it would be advisable to mark their envelopes to that effect.

A short report of the North Mysore Planters' Association is published.

From *Simmons Spice Mill*, we reproduce a very readable article which was extracted from the *Lancet* which analysed a cup of coffee and decided that coffee as a beverage is of universal benefit.

A correspondent of *Capital* writes an interesting article on the storage of Nitrogen by green manuring. The preparation of the ground applies more to Ryots cultivation than to our industries,

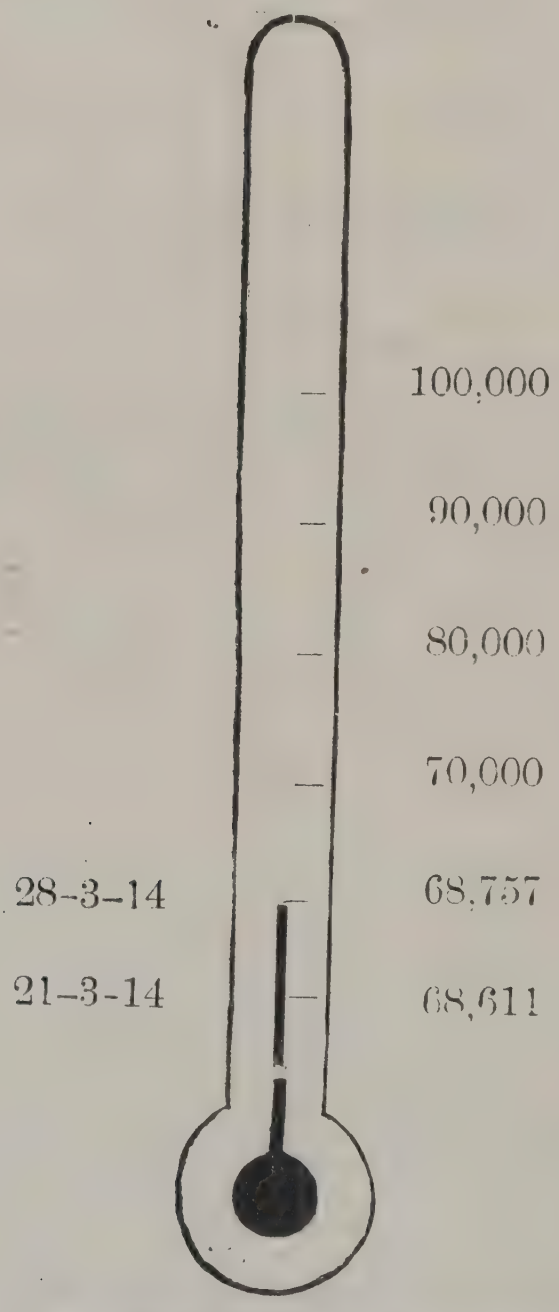
From the Consular Reports we publish an article on Brazilian Rubber which shows how that industry is handicapped and how nearly hopeless except for the very finest samples, must be the export. But the Brazilian Government are sure to come forward as they did with the coffee industry and save their Rubber industry.

During the absence of the Scientific Officer, who has week by week supplied a paper to this journal which usually filled two pages, we have much pleasure in placing these two pages at the disposal of any of our subscribers who would supply us with original matter. We regret that this week there has been no correspondonce to publish. We trust that this is only a temporary failure on the part of our correspondents.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

North Mysore Planters' Association,

Proceedings of the Quarterly General Meeting held at Balehonnur on 1st March, 1914.

PRESENT.—Messrs. H. G. Bonner, F. Morgan, R. G. Foster, F. W. Hight, E. H. Young, Thos. Hunt (President) and W. H. Reed (Honorary Secretary). *By Proxy*:—E. Lund.

Labour Department.—Papers giving the fullest particulars of the scheme were read, and a map showing the various spheres of influence was placed on the table.

A lengthy discussion took place and it was decided that all members be circulated at once and asked to join. Before the close of the meeting 4,200 acres were put on.

Election of Delegates.—Mr. W. H. Reed was elected to attend the Extraordinary General Meeting of the U. P. A. S. I. in Bangalore on March 11th.

Committee and Half-yearly Meetings.—The following proposal was made from the chair and seconded by Mr. W. H. Reed:—"That this Association reverts to the old form of having a Committee and half-yearly meetings."—Carried.

It was pointed out that it was unnecessary for the Committee to meet every time as a good deal of the business could be carried on through the Post.

The President, Mr. Thos. Hunt, placed his resignation before the meeting as he is shortly leaving for England.

A vote of thanks to the chair closed the meeting.

W. H. REED,
Honorary Secretary.

COFFEE.

The new crop from the Central American countries continues to come forward slowly and the supply has hardly been sufficient to meet the demand. The latter has decidedly improved, possibly owing to the firm time that has been established in Brazil, and the fact that dealers, particularly on the Continent and in America, had undoubtedly allowed their stocks to become so small that they were almost compelled to purchase. Of new Costa Rica only a very few good marks have as yet been received and the prices paid must not be taken as an indication of what will be the established quotations when larger supplies arrive, bnt rather that there was keen competition to fill up the deficiency in the stocks. For Colombian there has been a strong export demad, and quotations are 1*s.* 6*d.* to 2*s.* dearer, while common Costa Rica is slightly easier. In the terminal market there was more confidence, and prices advanced about 1*s.* 6*d.*, but there was a decline yesterday, though at the close the market is firm at only 6*d.* below last week.—*The Produce Markets' Review.*

COFFEE

The Chemistry of a Cup of Coffee.

The Leading British Medical Journal, *The Lancet*, deeply analyses the universal beverage and decides that it is a benefit to the human race.

From time to time numerous analyses of coffee have been made and published which, while giving some insight into the chemistry of the coffee berry, have not necessarily enlightened us as to the position of affairs in regard to the liquor obtained when coffee is prepared in the way commonly enjoined. The chemistry of the cup of coffee will obviously leave out of consideration the chemistry of the "grounds." It is the infusion with which the following laboratory notes deal, and certain fresh indications, we believe, have been obtained which are worth presenting in view of their medical interest. The story is far from complete, but there are interesting incidents in it which, as far as it goes, are worth recording.

A Comparison between Coffee and Tea.

From a pharmacological or, what should amount to the same, a dietetic standpoint tea and coffee ought in certain ways, at all events to act similarly, since both contain the alkaloid caffeine which has a well-known and marked effect of stimulation upon the central nervous system. It is generally admitted, however, that the two beverages, though having one thing in common, afford different results. Tea, it is well to point out, contains a much larger proportion of the alkaloid than coffee, but in the preparation of tea in ordinary domestic practice, a much smaller quantity of material is used than is the case with coffee. A common formula enjoined in the making of tea amounts to the preparation of 1·25 per cent. infusion of the leaf. Similarly, in the preparation of coffee the quantity of coffee usually directed to be used signifies a 6 per cent. decoction. Since tea contains from 3 to 4 per cent. of caffeine, and coffee seldom more than 1 per cent., it follows that as regards this alkaloid both infusions of coffee and tea made on common domestic lines will contain practically the same amount of caffeine volume for volume of fluid. The inference is that whether it be a cup of coffee or of tea, the dose of alkaloid will be the same. But according to the present investigation the caffeine in coffee infusion has quite different associates from those in tea. This would appear to be the case, inasmuch as while little caffeine is extracted from tea by cold water, we find that practically the whole of the caffeine in coffee is taken out. There seems to be little doubt, as we have shown in previous articles upon tea that the caffeine in tea is for the most part combined with tannin in the form of caffeine tannate, which is not very soluble in cold water, but is easily soluble in hot water. We think this is an important observation, for it points to the probability of caffeine existing in coffee in a quite different form which is easily soluble in cold water. Subsequent experiments showed that the caffeine in coffee is combined with a peculiar acid allied possibly to tannic acid, but exhibiting different properties from the tannin present in tea. Thus this acid (it has been called caffetannic acid by some observers) is not particularly astringent, has a sour coffee-like taste, does not coagulate gelatine, gives a light green coloration with perchloride of iron (whereas tannic acid of tea turns it black), does not make caffeine solutions thick as does tannic acid, does not precipitate alkaloids—*e.g.*, quinine—and, in fact, shows altogether different properties from the tannic acid of tea. It gives a precipitate, however, with lead acetate from which the acid can be separated by sulphuretted hydrogen. When coffee infusion is saturated with ammonium sulphate a precipitate is obtained which contains a small proportion of the total

caffeine in the free state, whereas a tea infusion similarly treated gives an abundant precipitate containing nearly all of the caffeine, this precipitate according to our observations consisting chiefly of caffeine tannate.

The absorption of Caffeine modified by its Associates.

The caffeine tannate of tea is precipitated by weak acids, and the presumption is that it is precipitated by the gastric juice, and therefore the caffeine is probably not absorbed until it reaches the alkaline alimentary tract. In the case of coffee, however, in whatever form the caffeine may be present, it is soluble in both alkaline and acid fluids, and therefore the absorption of the alkaloid probably takes place in the stomach. This fact may have an important physiological significance when we consider the comparative stimulating effects of the two beverages. If our view is correct coffee should act more promptly than tea as a stimulant and restorative, looking to its physiological action as due for the most part to caffeine. In practice it is generally accepted that coffee is a more powerful restorative than tea. The use of strong coffee as an antidote in poisoning by narcotics, notably morphia, is of interest in this connection. Tea is mentioned for the same purpose, but only rarely. Apart from the consideration that caffeine has probably a more rapid action when taken in the form of coffee than in the form of tea, because the caffeine in coffee is more readily absorbed, it must also be remembered that coffee is often made with a generous proportion of the powdered bean as in the case of the after dinner "black" coffee, the view being that the secret of good coffee is to make it strong. This, of course, is an entirely aesthetic demand, which may likely enough be opposed to physiological morality.

The strength of cold water extracts of coffee compared with boiling water extracts.

The fact that the caffeine in coffee is completely soluble in cold water suggested making a comparison as to the composition of the cold and hot water infusions in regard to other constituents. For this purpose several types of coffee were chosen, all of which reached England through Costa Rica. As will be seen from the accompanying table the varieties examined were as follows: Raw (*i. e.* unroasted) Costa Rica, common quality; raw Costa Rica, finest quality; pale roasted Costa Rica, common quality; pale roasted Costa Rica, finest quality; high roasted Costa Rica, common quality; and high roasted Costa Rica, finest quality. The results are instructive, and we may proceed to consider the differences in composition of the infusions, both cold and hot, shown where raw, pale roasted, and high roasted coffee are employed, and the relationships if any, of these differences to the discrimination supplied by the expert taster, who describes a particular coffee as, in his own words, "common" or "finest."

It is a somewhat remarkable fact that cold water extracts from coffee the same weight of materials as boiling water, but it must be admitted that the former infusion is somewhat less palatable than the latter. Chemically, however, there is little difference between them, and we may presume that physiologically a cold water extract of coffee will be much the same as a hot water infusion, leaving out aesthetic considerations, although these, of course, are exceedingly important, from all dietetic aspects. It is probable that cold water fails to extract certain oily bodies or fats which contribute attractive taste and aroma. The total extract is frequently higher in cold than in hot water. And not only is caffeine extracted from coffee equally well by cold and hot water, but this is true of the mineral salts and of the peculiar acid known as caffetannic acid, the acid which corresponds to the

tannin of tea. In regard to the proportion of material soluble in cold water coffee shows an entirely different result to tea, inasmuch as while coffee yields about 25 per cent. of its weight to cold water (an amount which is not increased when hot water is used) tea yields only 12 per cent. of its weight to cold water, which is increased to 25 per cent. when the infusion is made with hot water. Again, cold water extracts from tea only 17·5 per cent. of its total caffeine, while from coffee it extracts the whole. Similarly, cold water extracts from tea 13 per cent. of its total tannin, while coffee under the same treatment yields practically the whole of its caffetannic acid.

The Effect of Roasting.

An infusion of green or unroasted coffee is singularly nasty to the palate, and it follows that the roasting process renders coffee the palatable article that it is. The chemistry of roasting amounts largely to a caramelization process, during which certain oils and aromatic principles are formed as products of a mild destructive distillation. Curiously enough, there is little loss of caffeine in this process, as our results show, which is remarkable in view of the fact that caffeine sublimes at high temperatures. There are two degrees of roasting adopted—*viz.*, pale roasting and high roasting. The important chemical effect of roasting, according to our analyses, is to diminish considerably the amount of caffetannic acid. If the figures in the table be consulted it will be seen that while in an infusion of raw coffee (unroasted) the caffetannic acid amounts to 9·60 per cent., it is in the pale roasted 6·60 per cent., while by further roasting, as in the "high roasted," it is reduced in the infusion to from 3·63 to 3·90 per cent. What part caffetannic acid exactly plays as a dietetic constituent of coffee it is difficult to say, but if it should prove to be an undesirable element, then the high roasted coffees are least open to objection on this account. It may be noticed also that the raw coffee yields a greater percentage of soluble constituents to both cold and hot water than high roasted coffee, the pale roasted coffee, showing intermediate results. Roasting, amongst other things, has, therefore, the effect probably of rendering certain bodies insoluble, *e.g.*, albumins —while the slight burning effect upon carbonydrates would produce possibly some free and of course insoluble carbon.

The Analysis of Hot and Cold Infusions of Coffee.

Constituent.	Raw Costa Rica (Common.)		Raw Costa Rica (finest.)		Pale roasted Costa Rica (Common.)	
	Hot infusion.	Cold infusion.	Hot infusion.	Cold infusion.	Hot infusion.	Cold infusion,
Total extract ...	29·16	30·83	29·60	31·50	25·33	24·00
Ash of extract ...	4·16	3·88	4·00	3·88	4·16	5·66
Caffetannic acid ...	9·60	8·63	9·66	7·83	6·10	5·80
Total Caffeine ...	1·00	1·33	1·21	1·56	1·11	1·11

Constituent.	Pale roasted Costa Rica (finest.)		High roasted Costa Rica (common.)		High roasted Costa Rica (finest.)	
	Hot infusion.	Cold infusion	Hot infusion.	Cold infusion.	Hot infusion.	Cold infusion.
Total extract ...	23·50	25·66	24·30	24·00	25·60	23·00
Ash of extract ...	3·50	4·50	4·66	4·00	4·00	4·50
Caffetannic acid ...	6·60	5·90	3·90	3·16	3·63	3·87
Total Caffeine ...	1·05	1·06	1·23	1·11	1·05	1·20

QUALITY OF COFFEE IN RELATION TO CHEMICAL COMPOSITION.

From the results recorded in the table it will be seen that no definite relation can be traced between the aesthetic quality of coffees, classed respectively as "common" and "finest," and the chemical composition of the infusions which they yield. It may be noted that there is no important difference in the amount of the drug caffeine when the common and finest varieties are examined. It is probable that the aesthetic values—flavour, body, aroma and so forth—are related in some way to the amounts of oil bases or aromatic principles present, and these are in any case minute. Whether they are present in appreciable quantity or not doubtless depends upon the care spent upon the roasting process. At any rate, it is conceivable that a point in the roasting process could be reached which would deprive the coffee of all attractive flavour, while it is certain that the infusion of the raw unroasted berry is not fit to drink on account of its unpleasant taste. Recently it has been announced on more than one occasion that pyridin is an important constituent of coffee. We have certainly found it present, but not in sufficient quantities to estimate. It is rather a curious fact that some authorities mention that coffee often relieves asthma, while pyridin is described as "useful in the treatment of asthma" and "beneficial in cardiac dyspnoea, emphysema and angina pectoris," and, finally, that "it is probably the relieving agent of various cigarettes and powders smoked or burnt for asthma and whooping-cough." Another constituent of coffee produced by roasting is caffeol, a nitrogen-containing oil, but it would be impossible to differentiate the quality of of coffee upon an analysis pursued in this direction, inasmuch as the amount found does not exceed more than 0·06 per cent. It is doubtful whether it has any further value from a dietetic point of view than that supplied by its influence in pleasing the senses. When isolating caffeine from coffee infusion the solvent (chloroform) takes out also a non-crystalline substance which unlike caffeine is soluble in ether. This substance has a very strong, pleasant, but somewhat bitter flavour of coffee. The yield is different according to the quality of the coffee examined, and it is possible that this principle is a determining factor in the judgment given by the expert coffee taster. It is a product of roasting and does not exist in raw coffee.

FOOD VALUE OF COFFEE.

The infusion of coffee presents practically very little material that is of direct nourishing value, but by diminishing nervous fatigue, by virtue chiefly of the caffeine present, it may increase muscular power. It is not itself a builder of tissue. The use of coffee after dinner, it is of interest to note, is justified in a large number of cases by the fact of its stimulating effect upon the vital centres, and it is said to serve to some extent as an antidote to alcohol. It is commonly claimed to remove drowsiness; as a matter of fact, in many subjects it produces drowsiness, but this is usually followed quickly by marked wakefulness. The practice of drinking coffee after a meal for the sake of the stimulus which is experienced has much to be said in its favour dietetically. There is no reason for supposing that coffee possess any value as a food. The berry contains a quite important proportion of fatty substances (12 per cent) average, but these are necessarily excluded from the infusion, as owing to their insolubility they remain in the "grounds."

According to our analyses again the protein contents of a cup of coffee are small, approximating to 1·25 per cent. of the coffee extracted. This amount can have little dietetic significance. There is also a trifling quantity of dextrin and sugar present besides traces of alcohol, which again can possess no importance from a physiological point of view.—*Simmons' Spice Mill*"

NITROGEN.

The Storage of Nitrogen by Green-Manuring.

The element nitrogen may be aptly described as the staff and stay of organic life. No organism can be evolved, hope to exist, or reproduc itself in the absence of nitrogen. It is the fundamental constructive principle, the great primordial tissue-builder, the basis of the body and, so of the life of every living thing upon the earth. A fertile soil is the mother of the world, for, it alone can nourish the vegetable which is either the direct or ultimate source of the life of the beast and bird and creeping thing upon the globe. The fertility of the soil is a state or feature—the result of the operation in it of causes, natural or induced by the action of man—the prime factor in the evolution of which is the active presence of the element nitrogen. Nitrogen, then, being essential to fertility which, in turn, is necessity of life, it is of considerable human interest to comprehend the sources of it to the soil. Such comprehension is, in fact, the one essential step—the basis—in all serious efforts at the conservation of nitrogen with a view to the amelioration of the soil and its continued productivity.

The air is full of nitrogen—more than 80 per cent. of the earth's atmosphere consisting of this organiser of life ; and though every other state or form in which it occurs upon the surface of the globe has, at one time or another, been derived from this source, *in so far as plant-life is concerned*, the air is the least active or operative of all the fountain-heads of nitrogen. Nitrogen in the soil is met with chiefly in the particles of the layers which form its surface—within 9 to 12 inches of the level of the ground—as ammonia, nitric and nitrous acids, and organic nitrogen. Its immediate sources to the soil are the following:—(1) Meteoric water of every kind,—rain, hail, sleet, fog, dew, hoar-frost and the like deposits which, in precipitating, wash the air that lies above the level of the soil of much of the nitrogen it contains ; (2) Air in contact with damp soil,—the latter being endowed with the capacity, so long as it continues to be damp, of sucking up the nitrogen held in the former ; (3) Remains of the tissues of animals and plants which, having absorbed and retained the gas in quantity throughout the period of their life and growth, return it back again to the soil when they die and decompose ; (4) Leguminous plants,—the globose nodules on the roots of which, by harbouring bacteria of various kinds, are veritable factories for the fixation of nitrogen obtained direct from the air about them ; while, the decay in the soil of the mass of roots which these pod-bearing plants produce and let down deep into the earth is also a valuable source of the element ; (5) Permanent pasture which, like forest-growth, accumulates, up to the limit of its capacity, nitrogen in the soil that lies beneath it, (6) Manures rich in nitrogen, which though temporary in their action, are, nevertheless, useful and convenient sources of the element. Of these various sources of nitrogen, the remains of organic matter in the soil and the products of the activities of those bacteria which are symbiotic with the roots of leguminous plants, from the great economies which they would effect in their applications to tropical agriculture, are, obviously, the most important to us. For, the climatic conditions which prevail in the tropics do not favour the *accumulation* of nitrogen in the soil in quantity. Much of what is formed is washed out by rain or is carried down by percolation through the soil to depths at which it seldem is available for the needs of plants and crops. The desiccation of the soil in the drier months during which it is permitted to lie without tilth baked into a hard impervious crust, is scarcely conducive to the continuous activities of the bacteria which engage themselves in the storage of nitrogen in the soil. The incessant

access of air and moisture, warmth, and organic matter to the soil are essential for the life and healthy activities of these fertilising micro-organisms. Though vivified into occasional vigorous functioning by the exciting and stimulating climates of the tropics, their operations are too intermittent to result in the *continuous storage* of nitrogen in most of the arable soils under cultivation there. Thus, the necessity for the thorough cultivation of the soil, even whilst lying in a fallow state, and the addition to it of organic matter to sustain the requisite nitrogen in it are indicated in all regimes of culture anywhere within the limits of the tropics. In India, the grazing of cattle in forests and the universal practice of burning the dung, even where it can be conveniently collected, render the material from this source scarce for nitrogen storage in arable soils. "Artificial" nitrogenous manures are still too expensive for the means of the average ryot, so that, what remains to him now as the most economic yet efficient source of improving the nitrogen-content of his soils is comprised in the saving practice of the operation which has come to be known as "green-manuring." By this expression is meant the cultivation of a fast-growing, leafy, herbaceous crop which, when at the zenith of the glory of its succulence, is felled and ploughed into the soil to form a layer of manure by rotting there. Simple though this method of helping to store nitrogen in the soil of a field might seem, it is not easy of accomplishment, and, to be effective, has to be conducted somewhat in the manner described below:— Before the sowing of the field to the green crop, the soil should be thoroughly broken up with the plough and bared to the action of the weather for a season. Throughout this period it should be stirred by frequent cultivations with the harrow or other "cultivator" (*e.g.*, horsehoe, bullock-hoe, spring-tooth cultivator), particularly after each shower of rain and so soon as it would be workable then, and thereby kept in mellow tilth and thoroughly free from weeds and rubbish. The objects of this cultivation are to let in air, warmth, and moisture to the soil and to help it to conserve these for the crop or crops that shall be subsequently grown upon it. The selection and cultivation of the green crop itself needs much attention and care. To be altogether serviceable as an accumulator of nitrogen, this crop should consist of one or other of a mixture of some of the leguminous ones which are indigenous to the particular locality of the cultivation. Those specially suited for the purpose are such as form relatively little wood, are naturally capable of growing close together without detriment to their vigour on the field and, generally, the cheapest available to the cultivator. Among the commoner Indian field-plants that are suited for green-manure crops are Daincha (*Sesbania aculeqta*) Sunn Hemp (*Crotalaria juncea*), Green and Black Grams (*Phaseolus Mungo*), Lobia (*Phaseolus calcaratus*), Chowlee (*Vigna Catiang*), some of the smaller-growing annual Sims (*e.g.*, the dwarfed field-varieties of *Dolichos Lablab*), Indigo *Indigofera*, spp.), and Arhar (*Cajanus indicus*). In the cultivation of a crop for green-manuring, not only is the selection of the species of importance, but the sowing of the seed by a reference to the season against which the crop is intended to be utilised at the highest possible benefit to the soil, needs to be regulated with a good deal of caution and with a knowledge of the conditions obtaining in the locality. The climate of the tract and the weather-conditions which are immediately prevalent at the time of the sowings naturally affect and so, control the limits within which they shall be conducted. For the manuring of a cold-weather crop for instance, the green crop has to be sown in the rains; while, to fertilise one which is grown in the rains, it should be, obviously, sown soon after the cold weather crop (if there be one) is reaped, but before the

moisture in the soil will have had any time to be dissipated by desiccation. The sowings themselves are done "broadcast"—the seed, in each case, being scattered over the field so as to result in as dense a crop as it can hold or the soil support. Among the objects to be secured by this close sowing are the accretion to the soil of a mass of matter which by its decay not only liberates nitrogen in quantities adequate for the future crop, but also add a store of the element to the particles of the soil for a period whose duration is proportionate to the quantity of the green crop ploughed in. The periodic addition, by this means, of nitrogen to the soil of a field from which, but a moiety of it is abstracted by the crops grown upon it would tend to, before long, result in the storage of considerable quantities of the element in it. But of all the benefits accruing to the soil by this most interesting method of treating it, the stimulation of bacterial activities in it is, surely, by far the most important. For, these activities, it is, that result in the rendering of the stored and latent nitrogen ultimately available for the use of crops. In soils that are either stiff or free, the addition of the organic substance which is introduced by the mass of the green manure crop directly corrects their physical state and improves their hygroscopic capacity. The natural mulch afforded the soil by the presence of the green manure crop, whilst growing, renders the temperature of its particles equable, protects its surface from direct insolation as well as from most of the agents of denudation, smothers weeds and ultimately trends in the direction of the conservation of moisture and plant-food.

Such are some of the general benefits which the presence of a green manure crop confers upon the soil of the field in which it is grown, besides playing the greater and more special *rôle* of storing nitrogen in the soil-particles. And when, together with thorough cultivation, it happens to be included in the operations of *regime* which has for its object the restoration of fertility or the systematic maintenance of soil productivity, no hesitations will need to be entertained at any time of its efficiency to bring about the end in view; for, no more potent acids than these—thorough cultivation and green-manuring—can, in the present state of our knowledge, be enlisted in the service of the "tiller of the ground" for the perfect furtherance of either purpose. By their means, chiefly, is "intensive cultivation" possible anywhere in the world; they are the mainstay of agriculture in China and Japan; they are already known in many parts of India and are regularly practised in some of them; and no special acumen or vision of prophesy seems to be needed to predict that methods in which they play an active part would lead to the highest results attainable with the majority of the cultivated crops of India. A. M. S.—*Capital.*

Criticism is lost on the India Tea Cess Committee. It means to go on with the American, Continental and Home campaigns, and there is an end of it. In the next fiscal year Mr. Blechynden is to get another £10,000; Mr. Harrington another £7,500; Mr. Duchesne another £6,000. Yet Messrs. Brooke Bond & Co., tell us that the consumption of tea in the U.S.A. is still small; on the Continent of Europe it is still only a fad: in Great Britain and Ireland, there is no room for increase except *pari passu* with the increase of population. It would surely be better to spend 3½ lakhs of rupees on an Indian propaganda than in taking coals to Newcastle and trying to convince coffee, wine and beer drinkers against their will that they have been wrong all the time.—*Capital.*

RUBBER.

Condition of the Brazilian Industry.

(THE BOARD OF TRADE JOURNAL DATED MARCH 5, 1914)

The following information is from the report by H. M. Consul at Para (Mr. G. B. Michell) on the trade of that district in the years 1910—12 and part of 1913, which will shortly be issued :—

The principal export from Para is India rubber, and upon it depends practically the whole existence of the Amazon States. In consequence of the constant decline in the prices obtained for rubber in Europe and America during the last three years the trade of the Amazon basin has suffered heavily, and the commercial conditions at Manaos are now in a really desperate position, while those at Para are little better. This state of things is ascribed to many causes, *e.* g. (1) the competition of the product of the Malay States, Ceylon and other plantations in the Far East ; (2) the manipulation of the rubber market by a ring of brokers in Europe, who corner the article and force the Brazilian producers to accept almost any price offered ; (3) the high rate of freight for both river and overseas transport ; and (4) the excessively high cost of living and therefore of production.

With regard to (1), it is confidently believed locally that fine hard Pará can successfully compete in quality with any other rubber, that it is indispensable for certain manufacturing purposes and that if it had a fair field it would hold its own in the markets of the world. As regards (2) it is contended that the manufactures of rubber goods need a constant supply whereas the Amazon rubber is only available at certain seasons ; accordingly the speculators take advantage of the immediate needs of the producers to buy all their crop, and then retail it to the consumers as they require it. The latter have to buy from the brokers, the only holders, at prices which, if paid directly to the producers, would amply suffice to remunerate them, whereas at present the difference between the amount paid and that which reaches the dealers of Pará remains as an unfairly large profit to the intermediary, while the producers do not get enough.

In regard to (3) and (4), freight rates are high and consequently all imported supplies are dear. In point of fact, living is expensive, in Brazil largely on account of the extravagant standard of living and the neglect of agriculture and all local sources of food, clothing, building and other supplies. The result is that all employees have to be paid such high wages that the working expenses of running a ship are very great, and even with the considerable rates of freight charged little or no profit is made, and it would not pay any more ships to enter the trade.

There seems to be no doubt that hard fine Parà rubber is the best rubber obtainable, and were it free to compete on equal terms it could hold its own against all rivals. It may be true that the middleman exacts an unreasonable profit, but the law of supply and demand must prevail in the end and bring prices to their natural level. The truth is that the local product is burdened with taxes and charges which it cannot bear against the rivalry of increasing quantities of other rubber which is cheaply produced, though it may possess slightly inferior qualities.

Although wild rubber costs nothing in the first instance, and the utensils for its preparation are of the most primitive description, whilst the

smoking also costs nothing, nevertheless the product has to supply an expensive living to many hands before it reaches the consumer. None of the "seringueiros" has yet calculated the exact cost to him of a kilog, of rubber delivered at Para. Vaguely it is known that the actual collector must be supplied with food and all he requires while absent in the bush during the season. These supplies are advanced to him by an "aviador" who in his turn obtains them on credit from European or American Firms. The advances therefore reach the rubber gatherer at a very large premium. Both the merchant at home and the "aviador" have to fix a wide margin for loss. The cost of transport and insurance over huge distances on tropical streams has to be added, and the precarious nature of the credit of the transaction has to be taken into account.

The "aviador" has also to reckon with the bad faith of the rubber gatherer. Besides the usual launches and steamers that bring him the supplies and receive the rubber for the "avaidor's" account, a large number of small traders in sailing boats and barges (regatoes) visit the workmen on the river banks and purchase from him, or take in exchange for their wares, the rubber which the gatherer is really pledged to deliver to his principals. There are no means of checking the gatherer's production or of preventing this piratical trading. Indeed the estate owner or "aviador" cannot force the workman to pay him or even to remain working on the estate. When the conditions under which these men exist are considered—living and working in solitude in the dense bush for months at a time, without supervision, in a hot swampy land, with as a scanty supply of the barest necessaries of life, leading to a mortality in some cases of 80 per cent., it is not surprising that they welcome the irregular trader and indulge in whatever they can get from him, even at the price of the rubber which is not, strictly speaking their own.

Then the finished product has to be brought down by river to Pará, and there examined, and the various qualities cleaned and sorted. The State Government requires all rubber to be packed in boxes of a certain size and weight, each containing a certain fixed quantity of rubber. Although the Amazon district is one of vast forest the greater part of the wood for those boxes is imported from the United States. When the extremely high rates of wages and the profits required by each person through whose hands the rubber passes are considered, it will be seen that it reaches Pará already loaded with a heavy burden. It is generally believed that a kilog. of rubber costs 5 milreis (6s. 8d.) to deliver at Para. The price at present paid in the Para market for a kilog, of the best up-river fine hard rubber is 3.6 milreis (about 4s. 10d).

Then the State levies an export duty of 22 per cent. of the value or 20 per cent. if exported in boxes of native wood. The figures are :—19 per cent. for hard fine, entrefine or Caucho, and 21½ per cent. for Sernamby rubber. On the Acre product, which is the best, the Federal Government charges 20 per cent. as above. In addition to the duty the State levies another 2½ per cent. of the amount of the duty for contribution to the State Hospital (Santa Casa), another 3 to 4 per cent. of the official value of the rubber for the Bolsa (*i.e.*, the exchange building, now pulled down, but the charge is continued), and a further 1 per cent. for the Intendencia (town mayoralty). The Federal additional charge is that of 2 per cent. of the value paid by the party who sells to the shipper.

Add to these costs the freight to Liverpool, Hamburg, or New York, insurance, bankers' commission, discount, tare, brokerage, fire insurance,

&c., and it will be seen that the rubber is overburdened to an impossible extent.

It has been more than once suggested that the export duties should be lowered, but it was answered that so long as the middleman holds the field any reduction in the cost of the article delivered in the European markets would merely increase his profits. The argument is, of course, fallacious, but the fixed idea of the trade, in Pará is to fight the speculators by means of a co-operative association of the Amazon rubber producers, and accordingly in the last session of the Pará State Congress a super-tax of 100 reis (1'6*d.*) on every kilog. exported was voted, the proceeds to be devoted to the formation of a fund for the proposed *co-operative* (see page 270 of the "Board of Trade Journal" of 29th January). This tax is now (December, 1913) being levied in addition to all the aforementioned charges, and the question arises, how is the money to be found? Even if it is forthcoming, if the co-operative association is formed with a sufficient capital and with a wise and well-informed administration, and even if it succeeds in getting all the Amazon rubber into its own hands, it is still very questionable if it can long withstand the law of supply and demand in face of the competition of rubber from other sources.

In any case, it is evident that the natural—indeed, the only remedy against the collapse of the principal trade of the States of Para and Amazonas and the Federal Territory, is to remove every hindrance and to give their rubber a chance to stand for its existence, to abolish entirely all export taxes and every charge on products leaving the country, to do away with all import duties on food and the necessaries of life, to reduce the customs and other administrations to their purest and simplest forms, and to confine all expenditure rigidly to the absolute minimum.

There are many difficulties in the way of these measures. The export duties form a very considerable part of the revenues of the States concerned. The abolition of the duties would mean the loss of almost the entire revenues of the Amazon States, and this would have to be met by direct taxation, so arranged as not to fall on the labouring classes. There is therefore very little hope of anything of the kind being done.

Under the stress of the severe competition and the cost of collection and transport, it is likely that all but the finest rubber will disappear from the Pará market, and that the greatest care will have to be taken in purifying the best. At present the necessity of opening the balls, sorting out the inferior qualities and all adulterations, is an additional disadvantage to the Amazon rubber.

Lately a new and simple apparatus, invented by Senor Amandio Mendes has been adopted for smoking the latex, and gives very satisfactory results, very largely eliminating the entrefine quality, reducing the amount of Sernamby, and bringing the rubber of the islands (Cameta and other inferior sorts) almost up to the level of hard fine rubber.

The Brazilian have not adopted the tapping process advised by the Akers Commission and much used in the East, known as the "herring-bone" system. They claim that their own method and the use of their small hatchet is better. They also hold that the employment of acids, &c., gives inferior results to their plan of smoking the rubber, and leads to a rapid deterioration of the product.

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether and is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part in 20 of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzene They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent, if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE,

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Labour Barometer shows an increase of 4,300 acres, since last week. This is a hopeful sign and will, we trust, be an encouragement and an example to those who are still holding back. Only 27,000 more acres are required to establish the Labour Department, and to increase the influence and usefulness of the United Planters' Association of Southern India.

We hope on Monday next to distribute the Proceedings of the Extraordinary General Meeting held on March, 11th and 12th. It will be found reported in those Proceedings a point then decided, which we have been asked to bring forward prominently, that a member having, say, 500 acres, wishing to join the Labour Department must join it with the whole acreage and not a portion of it.

We publish the Proceedings of four District Associations. South Travancore have not seen the necessity of a Labour Commission, but we have great hopes that Mr. Richardson's persistent and persuasive eloquence and unanswerable arguments will yet reap their reward. It will be a matter of congratulation to all, that South Travancore have decided to come in on the 2 annas per acre basis which is paid by every other Association.

We reproduce an article on Green Manuring which is receiving so much attention, and draw attention to the table at the end of the article.

We have been asked to give publicity to a farewell Address to Mr. Aylmer Martin by his subordinates. We do so with pleasure as showing in what high estimation one who is the prospective Labour Commissioner of the U. P. A. S. I. is held by those with whom he has worked and augurs well for the future.

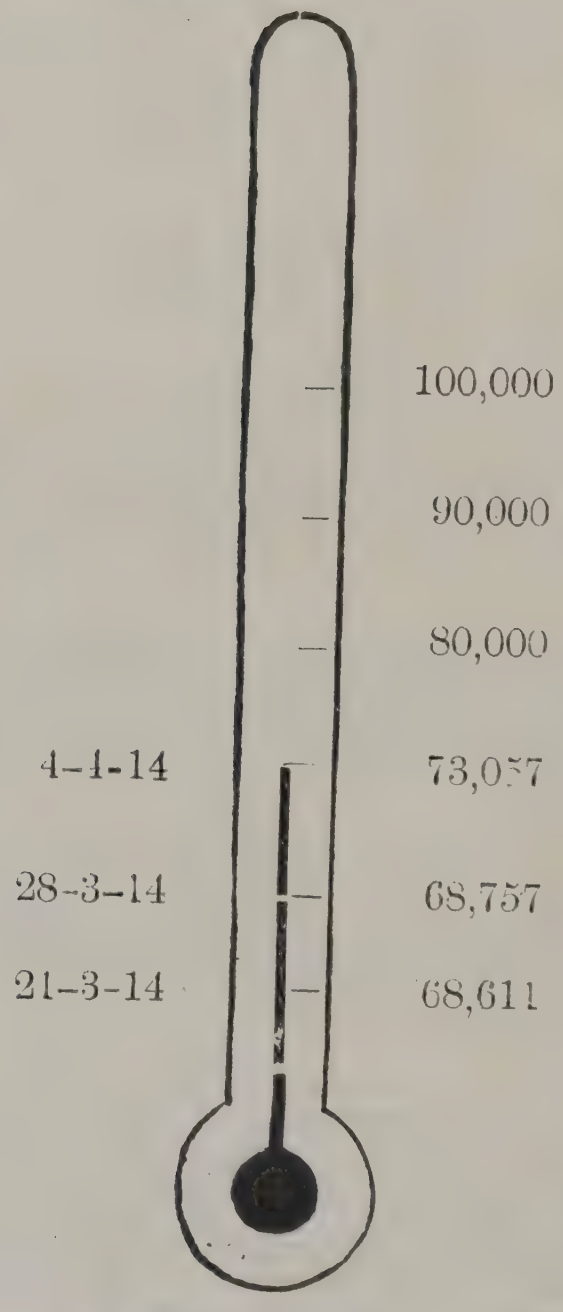
A few letters are published which should lead to further correspondence, and if properly handled should lead both to instruction and amusement.

We have received the Jubilee Proceedings of the South Mysore Planters' Association, which we regret we cannot publish in this week's issue but hope to do so next week.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the Annual General Meeting held at Quilon Club, on Saturday, March 7th, 1914, at 10 a.m.

PRESENT.—Mr. Chas. Brander (in the Chair), Messrs. H. B. K. Morrell, T. P. Alexander, J. B. Cook, L. G. Knight, E. Sherman, J. Stewart, Chas. Hall, J. H. Parkinson, S. A. Marten and H. C. Seymour (Honorary Secretary). *Visitors.*— Messrs. J. Mackie, Edward Lord, J. A. Richardson (Peermade) and L. Henderson.

AGENDA.

1. Confirm Minutes of the last Meeting.
2. Honorary Secretary's Report for the year.
3. Adoption of Accounts for 1913.
4. Report on Sri Mulam Assembly by Mr. Brander.
5. Alterations and additions to Planters' Association Rules.
6. The Labour Commission and correspondence *anent* the same.
7. Retention of Scientific Officer's services.
8. Correspondence.
9. Election of office bearers for 1914 and any other business properly brought before the meeting.

The Minutes of the last meeting being read and confirmed the Hon. Secretary then read his report for the year.

"Mr. Chairman & Gentlemen,—I have the honour to present my report to you for the year 1913. The acreage under cultivation at the end of the year was 12,939 showing an increase of 342 acres. The accounts this year have been audited by Mr. S. A. Marten to whom the thanks of the Association are due. Turning to the Balance Sheet it is very satisfactory to be able to show a credit balance of Rs.1,974-8-2. During the year there have been four general meetings and one Committee meeting. It is to be regretted that the average attendance of members was very poor. The number of estates on the book is now 21, one new estate having joined in 1913. During the year Mr. Stewart resigned the Chairmanship and Mr. Lord was elected, he however being unable to take up the Chairmanship, this necessitated a new election. Mr. Brander was elected Chairman. With regard to the year's work Mr. Cook represented this Association at the Sri Mulam Assembly. At this Assembly a European Ward was sanctioned for Quilon, but unfortunately this was afterwards cancelled.

At the Annual General Meeting held at Bangalore in August this Association was represented by Mr. J. H. Parkinson; the most important item affecting this Association was that of the proposed Labour Commission. This subject which comes before you again to-day at our Annual General Meeting has already been fully discussed and letters on the subject circulated to all members, and at the meeting held at Quilon in October this Asso-

ciation passed the following resolution: "That they do not see it was necessary for this District Association to have a Labour Commission on the proposed lines in the meantime."

In the month of October the Scientific Officer paid a visit to the Rani Valley and Poonmudi Districts.

The Planters' Benevolent Fund, of which a leaflet showing the accounts up to the end of 1912 has been sent to all members, had then only been drawn upon twice. This Fund is deserving of the highest support.

In conclusion I wish to record my thanks to the Chairman and Committee for their help during the past year and with this, gentlemen, I place my resignation in your hands."

The Honorary Secretary then read out a statement of the accounts which were adopted.

Mr. Brander then read his report on the Sri Mullam Assembly.

(*a*) *Sittar Elephant Shooting Case.*—This was not brought up before the Assembly as the case had been compounded on Mr. Cook paying a fine of Rs. 100.

(*b*) *Rani Valley Roads.*—This item I withdrew having seen the Chief Engineer before the subject was brought forward and as the work was now being satisfactorily attended to.

The alterations and additions to the Rules of this Association were then read out to those present and were adopted.

The next item on the Agenda was that of the Labour Commission.

The conditions under which Messrs. James Finlay & Co. were agreeable to hand over their Labour Commission to the U. P. A. S. I. proposed Labour Commission were then read out to those present but were not favourably received.

Mr. J. A Richardson from Peermade who was present at the meeting was then asked to address the meeting on the subject of the Labour Commission. His remarks, he said, had already appeared in the *Planters' Chronicle* and elsewhere, one of the chief things wanted was combination amongst planters. Perhaps the Labour Commission was not wanted at this very moment but most assuredly would be later on. To take an example 5 years ago the Nilgiris and Mysore had plenty of Labour, in Wynaad there was a cry of shortage.

People say the Malayalams will not emigrate but they do so and every month one sees coolies going down to the Straits. The Labour Commission might be a heavy tax at the present time but it was to the future one had to look to, and he hoped the Planters were now on the verge of combination.

Mr. Richardson then went on to say that he knew this Association was against the Commission, but that he hoped they would decide to send a Delegate to the meeting at Bangalore and hear all there was to say on the matter, before finally deciding to have nothing to do with the matter, which remark the Chairman thoroughly endorsed.

Mr. Stewart said he heartily agreed with these remarks and would ask the Honorary Secretary to write to the Secretary of the U. P. A. S. I. for figures showing how many acres had subscribed to the Labour Commission

in the different Planting Districts of Travancore. A hearty vote of thanks was then passed to Mr. Richardson for addressing the meeting.

Scientific Officer Fund.—After a short discussion it was agreed to subscribe to the above Fund for another year and the Hon. Secretary was asked to find out what views other Associations held on the matter.

Correspondence.—A letter was read from the North Travancore Planters' Association asking for this Association to support a petition to Government to allow tobacco for *private* use to be imported by post and duty paid at the office of delivery. This was put before the meeting and it was decided it would be of no use to support the resolution. A letter was read from the Secretary U. P. A. S. I. asking this Association whether they would now pay 2 annas per acre subscription to the U. P. A. S. I. instead of 8 pies. It was proposed by Mr. Stewart and seconded by Mr. Cook that this Association do pay 2 annas an acre to the U. P. A. S. I.

The following resolution by Mr. Morrell was then read: "That the British Government should be approached *re.* a Telegraph Office at Vadaserikera especially as we are now going to be all joined up by telephones in the District and could afford to pay for the man provided he looked after the telephone exchange as well."

This being put before the meeting it was proposed that the Hon. Secretary should write to the British Resident for his help in the matter. Mr. Stewart's resolution was then read out and was as follows: "That the Hon. Secretary be instructed to write to the other Associations in Travancore asking their views of having an Annual Meeting of Delegates from each Association at a central place about Sri Mulam time." This was seconded by Mr. L. G. Knight.

This being all the business with the exception of electing new Office Bearers for the year, Mr. Brander after thanking the Committee and members for their support then resigned the Chair.

Mr. Morrell then proposed that Mr. J. B. Cook take the chair *pro. tem.*

Mr. Cook then proposed a vote of thanks to the Chairman and Honorary Secretary which was seconded by Mr. Stewart.

It was proposed by Mr. Cook and seconded by Mr. Stewart that Mr. L. G. Knight be elected the Chairman for the year and Mr. T. P. M. Alexander, Honorary Secretary. This was carried unanimously.

The following members were then elected to represent the Committee for the year:—

R. Ross	... ...	Poonmudi District.
S. A. Marten	... ...	Rani Valley.
A. W. Leslie	... .	Kalthuritty Valley.

There being no further business the meeting terminated with a vote of thanks to the Chair.

HUGH C. SEYMOUR,
Hony. Secretary.

Coorg Planters' Association.

General Meeting of the Coorg Planters' Association held at the Bamboo Club, Pollibetta, 26th March, 1914.

PRESENT.—Messrs. W. M. Ball, G. C. Garrett, J. A. Graham, H. M. Mann, H. T. Shaw, E. L. Mahon, F. Macrae, E. M. Breithaupt, A. L. Alexander, H. Hammond, H. Jackson, N. Scholfield, A. H. Jackson, W. Egerton, J. W. Finlayson, H. G. Grant, W. A. F. Bracken, R. Hamilton and P. G. Tipping, Honorary Secretary. *Visitor.*—Mr. Allan Jackson.

Mr. W. M. Ball, the late Honorary Secretary, was voted to the Chair. The Honorary Secretary read letter from the President Mr. C. E. Murray-Aynsley, resigning the Presidency, as he was going home. A hearty vote of thanks was accorded him.

Read copy of letters sent to the Collector of Malabar *re*, almost impassable condition of the Coorg-Tellicherry Road, drawing attention to the total absence of preparations to remedy this disgraceful state of affairs. Resolved that a copy of this letter be again forwarded to the Collector.

The chief business then came before the meeting—Labour Department. Messrs. Graham and Mann, our Delegates to the Extraordinary Meeting of the U. P. A. S. I. at Bangalore on the 11th inst. made their report, answered numerous questions elucidating several doubtful points. After some discussion it was resolved that the Honorary Secretary should send out a circular to all members of the Association, asking those who intended supporting the Labour Department to send their acreages as soon as possible and notifying them that the calls would be at the rate of 8 annas per acre payable quarterly in advance, and that the first instalment was due in June.

Mr. Macrae proposed and Mr. Mahon seconded a hearty vote of thanks to our Delegates. Carried *nem. con.*

The following new members were then elected: Mr. F. H. Sprott, proposed and seconded respectively by Messrs. Graham and Ball; and Mr. G. A. Tippetts-Aylmer—proposed and seconded by Messrs. Shaw and Macrae.

Mr. Mann then proposed a hearty vote of thanks to Mr. Ball for his past arduous and tactful services to the Association and to Mr. Tipping for relieving him on the eve of his departure home.

A hearty vote of thanks to the Chair terminated the meeting.

PERCY G. TIPPING.

Hony. Secretary. C. P. A.

Bababudin Planters' Association

Proceedings of a Quarterly General Meeting held at the Siddabile Bungalow, Santaveri, on March 23rd, 1914.

PRESENT.—Messrs. A. B. Boyd (President); Noel G. B. Kirwan, H. Watson, H. Kerr, A. C. W. Denne, W. St. C. Johnson, F. D. Meppen, F. Hugonin and S. H. Dennis (Honorary Secretary).

Proceedings of the last meeting were taken as read and confirmed.

Election of Honorary Secretary.—Mr. N. G. B. Kirwan resigned as he was going on leave and Mr. S. H. Dennis was unanimously elected.

Freight rebates.—The correspondence on this subject was read and noted.

Co-operative purchase of manures.—That the Sub-Committee be asked to devise a suitable mixture say, in the proportion of phosphoric acid 8, potash 6, and nitrogen 4 and circulate members as to what amount they are prepared to take as a trial order.

Report of Delegates to the U. P. A. Extraordinary General Meeting.—The proceedings of this meeting having been published in detail in the press, it was not considered necessary to enlarge on the subject.

The following resolution was passed:—"That this Association heartily supports the suggestion made at the U. P. A., Meeting that the Scientific Department be taken over by the Government of Madras." A vote of thanks to Messrs. Boyd and Kirwan for their representing the Association in Bangalore was carried.

The meeting closed with a vote of thanks to Mr. Boyd for his hospitality.

A. B. BOYD,
Chairman.

S. H. DENNIS,
Honorary Secretary.

The Anamalai Planters' Association.

Minutes of an Extraordinary General Meeting held at the Oodmanpara Bungalow, at 2 p. m., on 23rd March. 1911.

PRESENT.—Messrs. C. R. T. Congreve (Chairman), E. W. Simcock, C, Howland, J. H. Jeffreys, A. A. Robb, J. Carless, R. Fowke, E. M. House, J. Ireland-Jones, J. E. Scott (Hony. Secretary). *Visitor.*—Mr. A. H. Robb.

Minutes of the last Meeting were read.

AGENDA.

1. To elect a Committee for the year.
2. *Labour.*—Report on Labour Commission Meeting.
3. Telegraph Office.

Proposed by Mr. A. A. Robb and seconded by Mr. A. H. Robb that Mr. Carless be elected a Member of the Association.

The following Committee was elected for the year:—Messrs. E, W. Simcock, A. A. Robb, R. Fowke, and the General Manager of Valparai.

Mr. Robinson's Report on the Bangalore Meeting was read.

Mr. Congreve proposed and Mr. Scott seconded a vote of thanks to Mr. Robinson. Mr. Robb proposed and Mr. Simcock seconded that Mr, Robinson be paid his expenses to Bangalore.

Telegraph Office,—The Hon. Secretary was instructed to sign the Telegraph Guarantee putting in the words: "at the said office at or near the site selected by the A. P. A. for the proposed Anamalai Hills Township."

The Meeting terminated with a vote of thanks to the Chairman and to Messrs. Fowke and Carless for lending their Bungalow.

J. E. SCOTT.
Honorary Secretary.

SOIL.

The Growing of Green Manures.

A great deal of interest is now taken in green-manuring, as a means of maintaining soil fertility. In certain cases large increases in yield have resulted from growing and turning in green-manure crops and there is no doubt, that this practice has improved very considerably the fertility of many soils.

The use of manure means healthy vigorous growth, which develops the power to resist insects and fungoid diseases. If the soil is worn out or deficient in humus, this must be applied either by means of cow-manure or a green crop, as the former is very scarce there only remains the growing and turning under of leguminous crops, which besides furnishing humus, supply the soil with a certain amount of nitrogen.

There is no doubt that as much combined nitrogen as is desirable is constantly at the command of the planter, what has to be studied, are the best methods for maintaining the proper supply on the most economical basis, both at the present moment and also considering the necessity of maintaining the fertility of the soil. It is quite evident, that as yet there are few, who are well acquainted with the supplying and the keeping up of a sufficiency of nitrogen in the soil.

Cultivation tends to decrease the amount of organic matter in the soil, as it hastens decomposition, by thoroughly aerating the soil and as the fertility of a soil depends a good deal on the amount of organic matter in the soil, a decrease of organic matter means decreased fertility. Thus in order to prevent a lessening of the soil fertility it is necessary to add to the humus of the soil whenever possible. Organic matter plays a great part in the mechanical condition of the soil, the addition of organic matter to clay soils opens it up, allows of a freer circulation of air and water, the result is healthier and more vigorous plants. In the case of a sandy soil, this valuable material, increases the water-holding power of the soils, its effect being marked in a time of drought, in the same manner it prevents to a certain extent the leeching of soluble plant food materials. Thus we see that green manuring is effective on both sandy and heavy clay soils and indeed in all soils deficient in humus. On sandy soils the effect is to consolidate the soil and in clay soil it acts by loosening the texture. When conditions as to warmth and moisture are favourable the green crop decomposes, without much delay, and the production of soluble plant food proceeds with considerable rapidity. This is especially the case with the valuable nitrogenous portion of the green stuff. Nitrification, that is the conversion of the nitrogenous material of the plant into soluble nitrates, takes place quickly. In sandy soils green manure nitrifies more quickly than ordinary organic manures such as bone dust, ground horns, etc., while in stiff clay soil it nitrifies even more quickly than animal manures.

Green—manuring is of two kinds—a non-leguminous crop may be grown and turned in, when it has attained sufficient growth. in which case naturally no addition is made to the store of plant food in the soil, the constituents removed by the crop being returned. The growing of such a crop might be valuable on a sandy soil to which soluble manures have been applied in a district, where there is a heavy rainfall, the crop would make use of part of the manures which might otherwise be leeched from the soil, then on the decomposition of the crop the plant food materials become available once more. The above method is practised solely for the purpose of improving the mechanical conditions of the soil by adding to its humus

content. The other method of green-manuring, and that most practised, is to grow a leguminous crop, which in addition to adding to the humus of the soil when turned in will greatly increase the nitrogen content. It may be said that the plant food supplied by green-dressings has been obtained from the soil, but this is not altogether correct. The nitrogen is largely obtained from the air through the medium of the bacteria in the nodules on the roots of this class of plants.

In growing green crops on tea estates the general practice has been to turn the green-stuff into the soil with a deep hoe, thus occupying considerable time and labour at a season of the year when labour can be spared with difficulty, this limited the area which could be green-manured on an estate to a very small acreage. Now that it is known that it is not necessary to resort to deep cultivation when turning in a green crop and that as good, if not better, results can be obtained by hoeing in the crop with the usual light cultivation, much larger areas can be treated every year.

It is found that on certain soils bulky crops of daincha, matikalai or other leguminous crops cannot be grown unless the soil has been previously manured. Speaking of leguminous plants, Mr. Bancroft writes in the *Queensland Agricultural Journal*:—"Failure to grow a leguminous crop is certainly not due to the absence of nitrogen-fixing bacteria, but to other causes such as unsuitable climatic conditions or a deficiency of phosphoric acid potash and lime. It is not unusual to apply a nitrogenous manure such as oilcake to the soil in order to obtain a heavy green crop, this would be quite correct, if the crop were a non-leguminous one and the object was only to secure a large addition of vegetable matter to the soil, but in growing a leguminous crop, one of the objects of which is to increase the nitrogen content of the soil, it is a mistake to manure the crop with a nitrogenous dressing. If a small application of phosphoric acid and potash is made a good crop of legumes will be ensured and with the nitrogen obtained through the medium of the leguminous crop the soil will have been treated with a complete manure.

The following figures will give some idea of how the bulk of green manure grown can be increased by application of a small dressing of potash and phosphoric acid.

GREEN CROPS GROWN.

	Crôtolaria.	Boga Medaloa.	Matikalai.	Daincha.	Average.
	Per acre. lbs.	Per acre. lbs.	Per acre. lbs.	Per acre. lbs.	Per acre. lbs.
224 lbs. Basic Slag	...	...	...	...	...
84 lbs. Sulphate of Potash	498	543	498	2,081	905
224 lbs. Basic Slag	...	...	...	...	...
84 lbs. Muriate of Potash	995	905	905	6,199	2,251
84 lbs. Superphosphate	...	...	...	...	...
140 lbs. Muriate of Potash	1,131	633	1,086	2,850	1,425
Unmanured	950	498	316	588	588

These crops were weighed just before being hoed in, a small representative area was measured off and the crop thereon carefully weighed. If we take it that a green crop contain 1·5 per cent. nitrogen, the crop of 2,251 lbs. per acre will supply as much nitrogen as 164 lbs. of sulphate of ammonia.—*Indian Planters' Gazette and Sporting News.*

A FAREWELL ADDRESS.

Address to A. F. MARTIN, Esq.,
Labour Superintendent,
Srivilliputhur.

We, the clerks of the Labour Department, K. D. H. P. Co., Ltd., Srivilliputhur, beg to approach you, Sir, with this short piece of address and beg leave to express our sincere and heartfelt regret for your departure from our midst. We think, Sir, we are not capable of doing full justice in this undertaking but we venture to give this Address as we feel it our duty to do so and some moral influence exercises upon us. It is 6 or 7 years since you settled here in this town as a Labour Superintendent of the K. D. H. P. Co., Ltd. During such a short period you have done meritorious deeds for the sake of our Company and for the promotion of the welfare of the people in general. We can't find words to express our feelings that are ruling over us when we think that you leave this place for six months but that feeling is overcome by the idea that you will soon return from Europe in October 1914, which as time is fleeting, will pass in six minutes.

It is not out of place to mention here about some traits of your character as far as we know. Versatility of doing things perfect quickness of understanding, ready wit, charitable disposition, kindness and sympathy you possess are all foot-prints on the sands of time for your subordinates, nay every man to follow. These would seem a flattery to a stranger but those who are acquainted with you would relish in this and say that we are actually depicting the reality. The rank and file, the young and old, the official and non-official without caste or creed love you with some sort of affection. Is it not true, Sir, that infants greet you daily when you pass along the streets and you accept their greetings very gladly and kindly? This shows that you gain popularity even amongst children. If your departure is made known to those children, of course beyond doubt, they will feel very sorry.

The Girls' School here is patronised by you by your generous contribution towards prize distribution which will aid to improve the female education. The interest you evince in Jellicuttu has gained the love and reverence of the working and agricultural classes. In our humble opinion you are a God-send, a luminary, and our pride.

It is a well-known fact that you have purchased a portion of land at your own cost and planted avenue of trees and freely granted the same to the Municipality. This act is a laudable one and the persons who pass the road especially in the hot sun will bless you.

Another thing worthy to be mentioned here is that you have established your everlasting fame and name here by founding a hamlet after your name. Needless to say, you as a Municipal Councillor have suggested proper measures for the good supply of water to this town, for which the people owe their gratitude to you.

Nature also feels sorry for your departure as is usual when great men leave a place. Trees and plants fade, the tanks empty and other scenery does not show usual brilliance.

"Love is bred in the eyes." If the love becomes mature and if the lover leaves the object of love, his heart drags at each remove a lengthening chain (love) during the time he is absent. So also, Sir, your heart is apt to

drag a lengthening chain (love towards Srivilliputhur and labour matters). But, in this case you will not feel the weight of the lengthening chain as Mr. Ward will make it for you as easy as possible. We are very grateful and at the same time thank you for your leaving behind you with us Mr. Ward as our presiding Officer, who deals with us as you do and who will, we are sure, continue to do so throughout. We also take pride, in noting that your son is in India during your absence.

We pray God that you and Mrs. Martin and children will have a happy and safe voyage to and from Europe and will return with redoubled energy and vigour. We hope that we will be blessed to have you in our midst at the end of the furlough you are now availing of.

After the Address was over, a group photo was taken and the proceedings ended.

Srivilliputhur, 26th March, 1914.

Tea.

Indian Tea.—The market continues to harden and buying is very general. There is apparently very little common Tea held by anyone, and all purchases are quickly taken up and cleared. This adds to the strength of the position, and it now seems very improbable that prices will be lower this season. The deliveries for home consumption continue to increase in a most satisfactory manner, and the exports also show considerable expansion. At the public sales competition was again very keen, and there was practically no Tea to be bought under 8¼d. per pound. All grades up to 8¾*d.* to 9*d.* were dearer, and while 8¼*d.* may be taken as the quotation for sound common leaf Tea there was no great quantity sold under 8½*d.* Autumnal sorts continue to meet with strong support, and high prices were realised ; tippy Teas were also in demand. For next week about 45,500 packages are in type, including a considerable quantity of Travancore.

Ceylon Tea.—There was again a strong demand for the slightly larger supplies offered at the auctions on Tuesday, and many Teas showed an advance. In whole leaf kinds the commoner grades were eagerly sought after, and very little was obtainable at 8¼*d.*, which was the lowest quotation. Broken Pekoes up to about 9½*d.* were mostly dearer, and it was difficult to follow recent purchases under that price, while the finer kinds remained firm. At the public sales 23,078 packages were offered, of which about 650 were withdrawn.

China Tea.—The private market is very firm, especially for Teas from lowest to 7½*d.*, and a steady business has been done. Operations so far have been chiefly confined to the largest buyers, but the continued high prices of Indian and Ceylon Teas have brought to the the notice of retailers the attractive value of clean Monings from 6*d.* to 7½*d.*, consequently a wider demand has set in. Fine and finest Teas are scarce and likely to be dearer. The recent Royal appreciation of the attractive and unique delicacy of fine China Tea is likely to be followed by an increased enquiry for pure self-drinking Monings. The most important point always to be kept in mind when buying such Teas, is to select a pure Flavoury Tea which " takes the milk well," that is, looks bright and creamy and not dull and lifeless, when the milk is added.

Java Tea.—There was a very firm market on Thursday when about 6,420 packages were offered. All kinds from the lowest to the finest sold at full prices.—*The Produce Markets' Review.*

COFFEE

Colombia Coffee Trade conditions Promising.

At the beginning of the new year, Alejandro Angel & Co., commission merchants, export and import, Whitehall Building, New York, published their annual review 1913-1914, for the special benefit of their friends in Colombia. Below we give some extracts, translated from the Spanish of the original review.

"While the year 1913 brought a number of political upheavals and many problems of a social and economic nature, which have agitated public opinion and taxed the intellects of the statesmen directing the destinies of the world, causing marked depressions in bonds and values of all kinds, and in various business and industries, Colombia has the fortune of finding itself among the few countries that have not been materially affected by these evils. There have occurred small commercial setbacks in some Sections of the country, but these have only been transitory, and the nation continues with firm step its prosperous advance. Nothing has contributed more to the rapid and steady progress which we have witnessed in Colombia during the last few years, than the administrative honesty of the present Government and the united effort of people for the maintenance of peace.

"Colombia produces to-day, in all, about 1,100,000 bags of coffee a year, which is more than any other country, with the exception of Brazil, and as there is not under cultivation to-day one-tenth of the soil suitable for the growth of the berry, there is no saying as to the possibilities of production which the country offers, considering that coffee is an article of prime necessity the consumption of which increases from year to year; and with the probability of success on the part of the Brazilian Government in its present campaign to introduce the coffee drinking habit among the 170,000,000 inhabitants of Russia, the prospects of a better demand and perhaps higher prices are fairly visible. There is, besides the fact that, according to reliable authorities, the plantations in Brazil are mostly on the decline, on account of age and wasting of the soil, so that it is not improbable that in no far off future, the consuming world will have to look to Colombia to supply its needs, if Colombia gives the necessary attention to the cultivation of the article.

"Colombian coffees, now that the Pure Food Law prevents their being mixed with inferior grades and the selling of the mixture as Bogotas, has considerably grown in favour with progressive roasters all over the country, who have had an opportunity to get them in their purity. We have noted, for example, that while the good qualities of Brazil, such as Santos 4's dropped from 16 to 12c. per pound, and fancy Bogotas that were then being sold at 18c., have sold for the balance of the year at an average of 16 to 16½c., or at a decline of hardly 12 per cent., against 30 per cent. for Brazils.

"The deep, rich, gravel soil of Antioqua, re-inforced with just the ideal weather conditions, accounts for the hard, flinty beans of the Medellin and Manizales grades, and give characteristics seldom found in any other coffee.

"We urge our friends in Colombia to plant coffee and to continue improving conditions of their plantations, as America demands the best to be had, and the best is not found dear at any price.—*Simmons' Spice Mills.*

CORRESPONDENCE.

Scientific Assistant, Mysore.

THE EDITOR,

The Planters' Chronicle,

Bangalore.

Sir,—Mr. Frattini tells me in his Circular No. 7 of a "curious fact."

I for one know nothing about his Kalisyndicate experiments and his regrets leave me cold. If the Scientific Officer wishes experiments undertaken on an extended scale presumably the initiative should come from him, and it will be time enough to denounce people when co-operation is refused.

Yours faithfully,

C. S. CRAWFORD.

Peruvanthanam Estate,
Mundakayam, S. India,
24th March, 1914.

Tea Yields.

THE EDITOR,

The Planters' Chronicle,

Bangalore.

Dear Sir,—I thought Mr. St. George would make us blink a bit with his Tea Yields from young 3½ year old bushes. If he would now give us his yield for its 3½ to 4½ year old period it would be of interest, and Mr. Deane Drummond could show us some very fine figures from his Estate.

I regret that I cannot advise "A Novice" without further data to go upon. If he will write me direct I will try and help him.

Yours faithfully,

H. B. KIRK.

24th March, 1914.

How to become your own Maistry.

THE EDITOR,

The Planters' Chronicle,

Bangalore.

Dear Sir,—There are two points in NIB'S letter in your issue of the 21st inst. which require reply. The first is:—

His assumption that the planting is invariably correctly done. NAB'S experience is not very great but such as it is, in this particular direction he has not observed the ideal conditions assumed by NIB. In the case of his Estate the trees though he presumes to have been planted at regular intervals have by actual measurement proved to vary from 7 to 30 feet apart. This fact destroys any hopes of arriving at a correct estimate of work done by tree counting. The second point is his failure to remark on the essential detail of the system which is the starting with a fresh base line daily. NAB'S experience prior to the introduction of the rope system was that the first

day's work on a field was generally easily checked but by the third day the coolies had got into such irregular lines owing to the varying tasks performed on the two previous days that any attempt to check individual tasks was hopeless.

NIB accuses me of the dreadful crime of being young and a novice. I plead guilty but, in extenuation, urge that it cannot occur again. May I ask if NIB ever suffered from the same affliction and if he did, whether he remained silent under it?

The prime object, or rather one of the prime objects of the *Chronicle*, I take it, is the free ventilation of working details connected with our trade and sneers, however good-humoured, are not precisely calculated to encourage novices *and others* to express themselves in your columns.

Words are cheap, but I trust I will be pardoned for mentioning that a job which required 606 (six hundred and six) coolies under NAB'S predecessor was performed by the latter with 220 men. A direct result of the rope system. Verb. Sap.

Yours faithfully,

NAB.

P. S.—The incoherency of "Coffee's" communication precludes comment.

NAB.

BRAZILIAN VIEWS ON RUBBER PRODUCTION.

Some interesting sidelights are thrown on the economic side of rubber collecting on the Amazon in the latest bulletin of the "Superintendencia da Defesa da Borracha," issued by the Brazilian Ministry of Agriculture, Industry and Commerce.

The collector receives payment in kind, and thus when prices fall he must either collect more rubber, curtail personal requirements, or drop work. The crop on the Amazon is financed eight to ten months in advance, the men leaving for the seringueiras about March, when the rivers are low. It is sent down when the rivers are rising in September, when the men mostly return to their respective provinces in Ceara, Rio Grande do Norte, and elsewhere. These conditions apply to the up-river workers, who are nomadic, but not to the settlers who work rubber in the Islands of Para and in the towns and villages along the lines of the main rivers. These settlers do not depend exclusively on rubber, and as prices fall, will be more inclined to turn their attention to cacao and other forms of agriculture, and to look on rubber as a stand-by. It is the policy of the Defesa de Borracha to encourage this side as the only way of making the Amazon self-supporting and reducing the cost of living.

To whatever level prices may fall, rubber will not fail to be collected by the population fixed to the soil, the settlers referred to, as long as the returns repay freights and leave a little over. Production, moreover, would in no case fall below 10,000 tons, even if the floating population recruited annually from Ceara and other places ceased work entirely. The volume of crops is not determined so much by the price of rubber, as by the credit of the aviadores and their ability to send men up country. Both have been greatly impaired this year by the almost continuous fall in rubber prices, and it seems doubtful whether they can count on sufficient financial resources to dispatch the usual contingent of rubber collectors next year.—*The India-Rubber Journal*.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 15.] APRIL 11, 1914. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

This week's issue of the *Chronicle* is taken up with the Jubilee Proceedings of the South Mysore Planters' Association, and we hope that when other District Associations come to celebrate their Jubilee, they will be able to publish an equally useful record. We have every reason to believe that the Arsikere-Mangalore Railway which has been the theme of continuous agitation by the planters of South Mysore, is certainly to be accomplished. But we would strongly advise the South Mysore Planters' Association to be ever on the alert to prevent the deviation of the proposed line.

The Barometer of the Labour Department has risen by 1,550 acres and has at the end of the present week reached 74,607 acres. We would remind our members that there are only eleven weeks to the 1st July, and that 25,393 acres are still required; and that this represents an average weekly increase of 2,308 acres. It remains and becomes the duty of those who have already subscribed to induce others, especially those who were called contingent or indefinite supporters, to come in and bring the tension to a close.

Bangalore after some six months drought, has had two very good showers. Every one to whom the rain was a blessing is happy. We are told that the one inconsolable man in Bangalore is the poor fisherman who had purchased the right to catch tank fish. We hope that all Districts that require rain have had showers: and that another prosperous year is before you all.

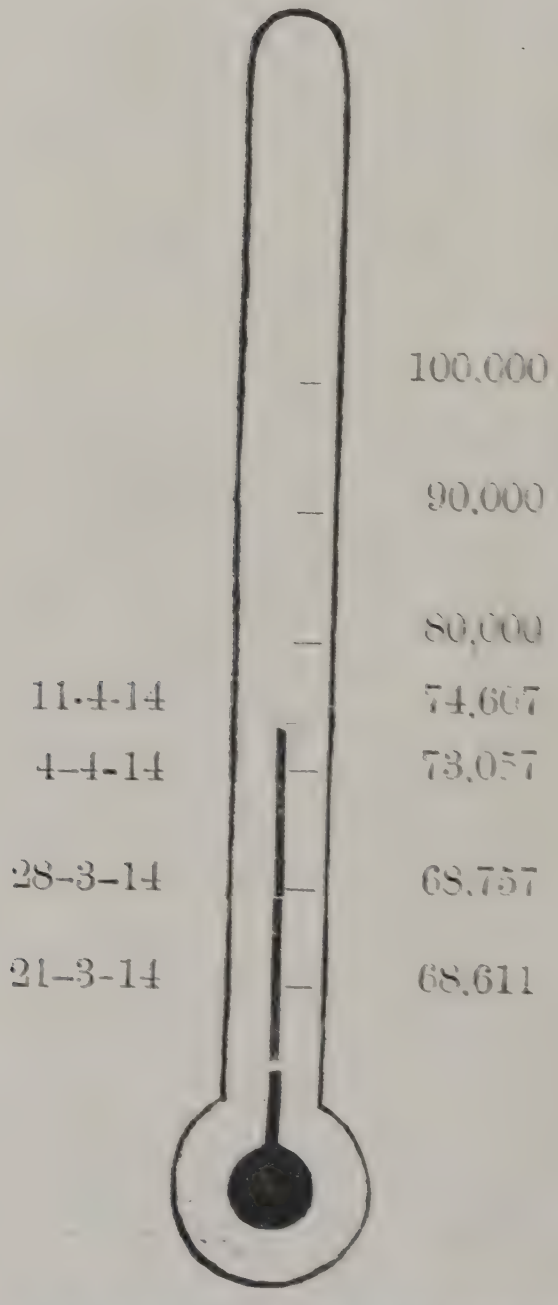
The Secretary is going on a ten-days leave from the 15th to 26th, and he would feel much obliged if correspondents will refrain from writing until the latter date; or will kindly accept this notice if there is a short delay in replies to any letters.

Though some time has elapsed since we sent out reply post cards to all Members of District Associations asking them if they wished for copies of Mr. Anstead's Book, we regret to say that not half have as yet been replied to one way or another. This prevents us giving Mr. Anstead the necessary notice. Will those members who have not yet replied kindly do so by return?

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

South Mysore Planters' Association.

50th Annual General Meeting held at the Travellers' Bungalow, Saklaspur, on March 16th and 17th, 1914.

PRESENT.—Messrs. Graham Anderson, C. I. E.; R. A. Anderson, Thiselton Anderson, H. G. Bower, W. L. Crawford, President; C. J. Hayward, V. Hunt, F. M. Hamilton, C. K. Pittock, E. W. Rutherford, S. Sladden, C Lake, W. Scholfield, H. F. Anderson, M. J. Woodbridge, (Honorary Secretary); K. Tammayer,

Visitors.—Hon'ble E. F. Barber, (Planting Member of Council); Messrs. P. W. Wetherall, (Deputy Commissioner); A. Middleton, H. D. Middleton, G. Guiver, P. Charlestone, K. T. Seshaiya, Mrs. C. Lake, Mrs. F. M. Hamilton, Miss Sladden.

Read Telegrams and Letters of Congratulation on Jubilee from the United Planters' Association of Southern India, Wynaad Planters' Association, Coorg, Central Travancore, etc.

A hearty vote of thanks having been passed to all those who had kindly sent congratulations and good wishes, the following Addresses were then read:—

(1) By the President.

Address of the President.

GENTLEMEN,—This is a happy occasion in the annals of our Association as we are to-day celebrating its fiftieth anniversary, and I think I am correct in stating in a way it is unique, for no other Planters' Association in South India has had an uninterrupted existence for half a century.

With your permission I will first touch upon some of the work undertaken during the year and later refer generally to what it has done or tried to do in the past.

I think we can congratulate ourselves upon the prosperous season now drawing to a close. Crops are mostly above the estimate, and although prices are not quite as good as those ruling last season, the larger yield more than compensates for the fall in prices.

It may be interesting at this time to note that some estates in this district were yielding well when this Association came into being fifty years ago and are now doing even better and larger crops. This fact should help to dispel fears entertained by those who think Coffee Planting is a very risky undertaking.

Act I of 1903.—During the year we asked for the introduction of the Act with the idea of getting extradition under it. Without it, the Act will be of no use to us and it remains for you, gentlemen, to see that we have a definite promise of extradition before we adopt it.

Arsikere-Mangalore Railway.—Considerable progress has been made in this matter and we have every prospect of seeing this much-needed and far too long deferred line constructed.

Roads.—Many complaints were received by the Association during the year about the bad condition of certain roads in this neighbourhood, and there is, I fear, ample ground for them. The total absence of the N. E. monsoon has been a contributing cause to their disrepair, and also the very large and increasing export traffic in grain that has grown up during the

past few years and which previously did not exist. This is a factor that has seemingly received no attention from Government when allotting funds.

It is much to be deplored that the Association is not informed when the Superintending or Executive Engineer visits Mudigere or Saklaspur, as I feel sure, if Government would permit representatives of the Association to meet those gentlemen when on tour in this district and point out to them the parts that are complained of, nothing but good would result, and a constant source of friction removed.

Seat on the Hassan District Board.—The privilege the Association had enjoyed for thirty years of nominating one of its members to serve on the Board was, it is much to be regretted, withdrawn in a very arbitrary manner, and for no apparent reason, and no explanation was offered for this very extraordinary proceeding. In self-defence the Association had to take the matter to the Government of Mysore and I am glad to tell you the privilege was at once restored to us.

Labour Commission.—This subject was very thoroughly gone into at a special general meeting of the Association, largely attended and representative, and the opinion was in favour of the establishment of a Labour Commission for South India, as it seems this is the only practical solution to the labour difficulty, which is becoming more and more acute.

His Excellency the Viceroy's Visit to Mysore.—As has been the custom in the past, this, jointly with the North and Bababudin Associations, waited upon His Excellency with an address of welcome, and an expression of our loyalty to the Throne and person of Their Majesties the King-Emperor and Queen-Empress,

Scientific Officer.—Mr. R. D. Anstead is shortly proceeding on a well-earned holiday, and I am sure you will all join me in wishing him and Mrs. Anstead a very happy time at home, and that we will see their return to Bangalore with renewed health and strength. I would like again to thank Mr. Anstead in your name for the valuable work he has done for us, and to tell him we are all very grateful for his assistance and advice on the many problems that confront us. Mr. Anstead may not be aware of, but it is nevertheless a fact that the value of scientific advice and assistance is becoming more and more recognised and taken advantage of by the planters of Southern India.

Green Bug.—This pest unfortunately made its appearance on some estates in Mysore during the past year, and the outbreak has given some trouble. I am of opinion, after a somewhat close experience of the nuisance, that it will give an enormous amount of trouble if neglected, but if looked after and the usual precautions taken, it should not be more than an additional expense and worry to us, similar to other pests we already have and are familiar with.

Co-operative Purchase of Manure.—It seems to me that the members of the Association, as a whole, are not as keenly alive to the importance of this matter as they might be. A start, however, in a small way has been made, and the great advantage of co-operation has been demonstrated by the saving in cost, and I hope next year more interest will be shown in the matter.

Deep soil Cultivation by Dynamite.—An experimental demonstration of deep soil culture by means of dynamite was carried out at the request of the Association, and the results will be watched with great interest and in due time reported upon.

The Late Mr. J. S. Middleton.

It is with sincere regret I have to mention the death of the oldest Mysore planter, Mr. J. S. Middleton. He was an original member of the Association and one of the pioneers. Our sympathy is with the widow and family in their sorrow.

A RETROSPECT.

We are extremely fortunate in having amongst us no less than four of the original band of nineteen men who founded this Association fifty years ago. They are Messrs. R. A. Anderson, Graham Anderson, C. I. E.; R. H. Elliot and David Cannon, the two first named being present here in the room, and you will all join me in expressing our very great pleasure that they are able to be with us to-day. In the past both have served the Association with great credit; their influence amongst us has always been for good, indeed, I have no hesitation in stating that during the years that are past, when storm and stress came upon the Association, it was in no small measure due to their kindness of heart, tact, self-sacrifice and generosity that it was kept going upon its useful career.

That the Association has always had the general welfare of those living in this part of Mysore, European or Indian, as its first care, and taken a broad outlook on planting politics, generally, I do not think any one would attempt to deny. Upon an occasion like this it is possible to review what has actually been accomplished by the Association acting as a body, or by individual members, without being called egotistical, and I would like to mention as briefly as possible some of the larger matters this Association has been able to initiate or bring to a successful issue.

For many years the Association continued to represent the desirability of an acreage assessment, instead of the objectionable Halut cess of 4 annas per maund on the crop, a manifest tax on industry, and in spite of the best efforts of the late Sir James Gordon, the then Chief Commissioner, the change was not conceded. It was reserved for His Highness the Maharajah Sree Chamarajendra Wodyar Bahadur, in 1881, at the Rendition, to grant this most important concession to the Planters of Mysore, European and Indian.

The introduction of Cardamom cultivation as an industry was initiated by the late Mr. J. S. Middleton in Munzerabad, and so successful has the industry become, that the value of the Cardamom crop in Mysore is now annually valued at seven lakhs of rupees, and is one of the most paying crops of the ryots of the Malnaad.

The introduction of the Nalknaad Coffee seed into Mysore was accomplished by the late Mr. Stanley Jupp, and it is difficult to estimate the amount of good this did the coffee industry. It is not too much to say it gave it a new lease of life and converted estates that had failed to pay under the old variety of Chick coffee into prosperous concerns once more.

In 1876-77 Famine Relief Measures were most ably carried out by Mr. Graham Anderson as Chairman of the Local Famine Relief Committee, and his brother planters, and it was his skill, energy, benevolence and hard work that largely prevented the Mulnaad sharing almost the same dire fate as the rest of the province in those awful years.

By bringing up rice from Mangalore in the face of enormous difficulties, establishing food depôts for the starving people and the formation of nurse-

ries to look after and maintain the children, he was able to avert the worst effects of the famine in the coffee districts.

The credit of initiating and founding the United Planters' Association of Southern India belongs almost entirely to Messrs. J. G. Hamilton and Digby T. Brett, who did the spade work making the founding of the U. P. A. in 1894 possible. The direct outcome of this was, as you are aware, the granting of an additional Member of Council to represent planting interests on the Legislative Council of Fort St. George.

The establishment of the Mysore Agricultural Department and the Scientific Department of the U. P. A. are both the direct outcome of many representations made by the combined Planters' Associations in Mysore, and the greatest credit is due to the late Sir K. Sheshadri Iyer, Dewan of Mysore, for his wise statesmanship, and to Messrs. Harris and Norton for their share in carrying these matters to a successful conclusion.

I believe I am correct in saying the idea of a Game Preservation Law in Mysore originated in this Association, or at least the records would lead one to think so.

The Arsikere-Mangalore Railway is, as I have already said, in a very hopeful stage just now, the first section from Arsikere to Hassan having been sanctioned. If the line ever reaches Mangalore this Association will deserve a generous share of the credit of getting it built, as for the past 25 years, in season and out of season, we have pressed for the construction of this essential Railway for Mysore as a whole and only in a lesser degree for the province of Coorg. These, gentlemen, in themselves are a no mean record of service to the planting community and they only form a small part of the activities of the Association during the past fifty years.

Before I turn to another matter I would like to point out, with the strongest emphasis at my command, your Association can only be what you yourselves make it, nothing more or less, and it rests with you to make it the same live power in the future as it has been in the past.

Planters are, as a body, I fear, to blame for not taking themselves or their business as seriously as they should. One often hears surprise expressed at any one living in the jungles, being a planter, or disparaging remarks about their work, and sometimes pity for them. trying to make a living out of a worn out industry!

Fortunately for us their pity is misplaced: personally I know of nothing in India that returns such substantial profits as a good and well worked coffee estate. I know of one group of estates in Mysore aggregating one thousand acres that have given an average annual profit over a period of 22 years of seven thousand five hundred pounds, and another property of 500 acres that has yielded its fortunate owner during the past ten years an annual profit of three thousand pounds, and what is more, on an initial outlay of five thousand pounds! These facts will, gentlemen, go, I hope, some little way to prove our business is as prosperous now as ever it was.

Before I sit down I would like to say a few words about this beautiful land we live in and its Government. I personally know the western portion of Mysore from Bisley to Koppa, having passed the best years of my life here, and I unhesitatingly say it would be difficult to find in the whole of India, and possibly a large part of the world, a land as beautiful as our coffee districts. North and South, every description of scenery is to be found in them and all varieties of game, from snipe to bison, and the

planter would be an extraordinary person if he did not admit his lot is cast in pleasant surroundings, his work congenial, his recreation varied and extensive, and the climate good.

I have always found the intentions of the Government of His Highness the Maharajah sympathetic and benevolent. I do not, however, admit these good intentions are at all times permitted to mature and bring the maximum happiness to the maximum number. I will state quite frankly I consider the very best intentions of the Government are sometimes nullified by the indifference of those deputed to carry them out. Taken as a whole, I am very glad to state I have noticed, during my twenty-five years' residence in the Mulnaad of Mysore, a steady and sustained improvement in practically all the departments of Government, with the exception of education, and in that respect, as far as Munzerabad is concerned, I have observed little or no improvement, in fact, I think there has been retrogression, which is very much to be deplored. This taluk of Munzerabad is about 600 square miles in area with a population of 70,000, and has, I believe, but ten Government aided elementary schools and a few struggling private village schools, many of which I remember to have seen in past years being conducted in the village temple or headman's verandah, have, to a large extent, owing to the indifference of the Government, been let to expire. This, I think, is nothing short of a misfortune, and might have been prevented by a little sympathy, advice and a very small financial grant. How the Government contemplate teaching the inhabitants of the Mulnaad to ameliorate their present condition, without first giving them the chance of obtaining a very modest elementary education, I am at a loss to understand. As a concrete example of how this taluk has been treated by the education authorities, I might point out the Anglo-Vernacular school house in Saklaspur was let to fall down fourteen years ago. I watched with astonishment the indifference of the local authorities to the matter. Well, gentlemen, it is fourteen years since the old school-house fell down, and now, nearly a decade and a half afterwards, a new school-house is being built to replace the old one; this would seem to indicate, as far as the Mulnaad is concerned, it is not necessary to do things promptly.

In conclusion, gentlemen, I cannot do better than quote the remarks made by His Highness the late Sree Chamarajendra Wodyar Bahadur, in reply to the Planters' Address presented at the Rendition: "Agricultural pursuits are the mainstay of the people of this country, and an enterprise like coffee cultivation by a body of English gentlemen possessing energy and capital must promote the prosperity of the country and stimulate and develop the native industry. I accordingly assure you, gentlemen, of my support, and encouragement from my Government, and I would express my hope that the planters living and working amidst the native population, with that mutual regard and respect for each other's rights which is the peculiar characteristic of the British, will be able to raise the status of the native agricultural population and bring English knowledge and energy to bear upon them for their benefit in a way which cannot be in the power of any Government to accomplish."

The European planter in Mysore has amply justified this hope—his bungalow has always been a centre of civilization, and there is no one with whom the Indian planter or villager is more in sympathy and to whom in times of illness or trouble he goes with the certainty of receiving that measure of help and personal service which is in itself of no small educational value.

(2) By Mr. Graham Anderson, C.I.E.

Address of Mr. Graham Anderson, C. I. E.

GENTLEMEN,—As you are aware, it is customary for all Scotsmen to claim special privileges at their great annual festival, in the matter of recording their achievements, and I feel sure that you will accord to me on this occasion a certain amount of indulgent toleration while I endeavour to perform some of the duties of remembrancer in regard to events of the distant past, more especially as I have not the slightest intention of claiming any credit for my countrymen, except in their capacity of British subjects domiciled in this interesting Province.

I would desire, further, to point out that, as the principles on which our Association has been worked are unity of purpose, continuity of policy and co-operation, all good results which have been obtained are clearly attributable not to the exertions of any section of the planting community or to any single Association, but to the collective representations of our brotherhood, backed by the powerful advocacy of the Press of the Madras Presidency being accorded sympathetic consideration by the Government.

In the time allotted to me this morning it would be impossible to do more than make a few brief remarks relative to those matters in regard to which negotiations have extended over many years and while cherishing grateful memories of what was effected before the Rendition, to thankfully recognize the material progress and administrative improvements which have taken place since that memorable event under the guidance of those far-seeing and sympathetic statesmen, Mr. Runga Charlu, Sir K. Sheshadri Iyer, Sir P. N. Krishna Murti, Mr. Thumboo Chetty, Mr. V. P. Madhava Rao, Mr. Ananda Rao and Mr. Visvesvaraya, the present Dewan of Mysore who have vied with one another to give full effect to the benevolent intentions of Their Highnesses the Maharajahs of Mysore.

Our President has so fully justified the existence of this Association that nothing remains to be said on the subject, and I venture to think that in addressing you at the special invitation of the executive, my principal object should be to endeavour to place the younger Members in possession of information which they could not readily obtain without a protracted study of the records of the past.

I naturally very gratefully appreciate the kind way in which the President has referred to me, but I desire to assure you that I can never sufficiently thank my brother Planters for the innumerable favours which they have so unworthily bestowed on me and for their self-denying courtesy in granting to me opportunities which were clearly their own, and remembering those evidences of friendly confidence and regard, it has at all times, naturally, been an abiding incentive to me to do my duty to the best of my humble ability to prove that I fully acknowledge the reciprocal obligations on which all true friendship is based.

Having made these preliminary remarks, I will now briefly allude to the formation of the Mysore Planters' Association and endeavour, in a general way, to show how changes have gradually occurred, the result of which is the existence at the present day of three separate Associations.

The Mysore Planters' Association was formed in Saklaspur in 1864, under the Presidency of Major-General Ottley, with Mr. W. Lonsdale as Honorary Secretary, with the avowed object of representing the inequitable conditions then existing, owing to the Halut, or Excise Tax on Coffee, being regarded as a tax on industry as the greater the amount of crop produced by work and capital, the heavier the Government demand appeared to be.

Its first representation was made to Mr. Lewin Bowring, the Chief Commissioner, and the signatories to a subsequent Memorial in 1866, addressed to the Right Honourable the Secretary of State for India were nineteen in number.

It is extremely distressing to find that there are now only four surviving representatives of the original founders of the Association, but I must point out that my cousin, Mr. R. A. Anderson, was in England at the time, and that he and Mr. R. H. Elliot are the only survivors of the group of pioneers who opened up land for coffee in Munzerabad, the others being Mr. F. Green (who began in 1843) ; Mr. Lonsdale and Mr. J. S. Middleton, the latter being also the first to introduce the systematic cultivation of Cardamoms,

In the Northern Mulnaad the original Planters were Mr. Thomas Cannon; Mr. F. D. Meppin and Mr. W. Allardice, the first of whom was engaged in planting long before it was extended to the South.

For nearly sixteen years the Association continued to be the only duly constituted medium for representing and adjusting all matters of collective importance affecting the interests of the entire planting brotherhood of Mysore ; but owing to the steady and important extension of the industry in the Northern Mulnaad, consequent on the success attending on the introduction of the Nalk Nad variety of coffee in 1872 and taking into consideration the peculiar conformation of the planting zone, it was found necessary to concert measures which, while adding considerably to the general convenience of Members, were calculated to consolidate the influence and extend the sphere of usefulness of this institution.

At a General Meeting held in Hassan in September, 1880, it was arranged that all business of a purely local nature should be confined to two branches, one continuing the designation of the Koppa Planters' Association, the other, for obvious reasons, being styled the South Mysore Planters' Association, while the original Mysore Planters' Association should be maintained for the transaction of all business of collective importance.

These arrangements worked fairly well for several years, but the great distances which members had to travel to attend meetings detrimentally affected the efficient working of the parent Association, and although the transfer of the headquarters of the planting community to Chickmagalur, consequent on a territorial re-adjustment by Government, made with a view to amalgamate the planting Taluks into one District, was taken the fullest advantage of, the ultimate result was the withdrawal of those Members who resided in Koppa and Kadur from the original body and the formation of the North Mysore Planters' Association.

The reduction of Hassan to the status of a Sub-Division being found to induce grave administrative difficulties, the Government reverted to the former system of maintaining Hassan and Kadur as two first class Districts.

More recently a third Association has come into existence under the designation of the Baba Booden Planters' Association.

These three institutions, while working in cordial co-operation in regard to preliminary discussions and deliberations, have transferred the duties connected with the representation and adjustment of matters of collective importance to the United Planters' Association of Southern India, which was the outcome of the Conferences held in Bangalore in 1893 and 1894.

It is, therefore, self-evident that in celebrating this Jubilee, we are doing so as the only remaining branch of the Mysore Planters' Association, as the

members of the Koppa branch were absorbed by the North Mysore Planters' Association.

The whole planting community of this province owe a debt of gratitude to the Chief Commissioners and British Residents of Mysore for the patient consideration invariably accorded to all representations, and although at first sight it may appear ungrateful to mention only two names from the long list of administrators of such eminent ability, still the fact remains that Sir Richard Meade and Sir James Gordon will ever be remembered as having had the largest share in the adjustment of matters affecting planting interests generally, in precisely the same way as more recently has been the case with Sir K. Sheshadri Iyer and Mr. V. P. Madhava Rao.

The negotiations relative to the necessity for substituting an acreage assessment, coupled with improvement of tenure and for modifying the peculiar position of disadvantage in which Planters in this Province were placed, owing to the want of reciprocal facilities for the execution of warrants, occupied unremitting attention up to the Rendition which took place on the 25th March, 1881, when His Highness Chamarajendra Wodyar Bahadur conferred on the planting community the great boon of sanctioning the introduction of the permanent system of tenure on the basis of an acreage assessment as the first official act of His Highness' administration.

It is only to be regretted that His Highness was powerless to also alter or improve the inequitable conditions relative to the service of warrants and processes issued by the Courts of Mysore relating to minor offences which have been the direct cause of the loss of many lakhs of rupees and given rise to a peculiar description of fraud against which there has been absolutely no protection whatever.

It is quite a mistake to imagine that these reciprocal facilities are only required by the planting community as they are essentially necessary to foster trade and industrial operations generally. As the law stands, persons guilty of all minor offences have only to cross the frontier line to escape punishment, and a continuance of this state of affairs, now that railway communication has been extended, is not only a positive encouragement to fraud, but is calculated to frustrate the most systematic efforts having for their object the suppression and prevention of crime.

It is surely an anomalous position of disadvantage that owing to the fact that, although Mysore is bound under the terms of a simple Notification of a Chief Commissioner issued previous to the Rendition to accord the fullest attention to all warrants or processes issued in British territory, its own Courts are denied any corresponding conveniences.

I would in no way desire to complicate any negotiations which may have to be made in the future, relative to the possible necessity for the introduction into Mysore of a measure similar to the new Madras Planters' Labour Act, but I think it is only right to point out that the very essence of our original appeal was for the introduction of simple improvements which would enable patience and leniency to be exercised towards those who, by giving a portion of their time to work at certain seasons of the year, are the means of supporting industrial enterprises which have congenial employment constantly available.

This is the reason why Lord Wenlock's proposal relative to a system of Bailable Warrants was received with so much approval, and of the disinclination to ask for the introduction of a complicated Labour Law.

I affirm without the slightest fear of contradiction that the very indefinite indication contained in the Act of the possible grant of reciprocal facilities for the service of warrants will be the only inducement that is likely to have any influence on many members of the planting community when a consensus of opinion has to be secured.

The excellent work carried out by the Survey and Settlement Department under the direction of Colonel J. P. Grant, will ever remain as a monument, of carefully conducted operations which have added to the security and contentment of all classes and communities, the prosperity of Mysore being almost entirely subordinate to success attending agricultural pursuits.

Associations like ours have an educative influence on their Members, who, profiting by the discipline and experience of such organizations, are the better fitted to render assistance in times of unexpected difficulty.

This was clearly proved in the great famine in 1877, when Members of this Association, the Ladies of the District and the leading representatives of the Indian community worked cordially together in the management of eight Nurseries and eight Depôts necessary for the relief of many thousands of starving people, who flocked into Munzerbad during that fearful visitation, and I cannot find better words to give expression to our present sentiments than those recorded many years ago by the Association :—

" The industry in which we are engaged, affording as it does constant congenial employment to thousands of the rural population, and being the active medium for bringing money from the European Market, is in every way suited to the requirements of the Mulnaad and if friendly influence can be made in any way to stimulate the adoption of improved methods among the surrounding inhabitants, the Planter will ever be proud to use their best endeavours to secure the fullest and most benficial results."

In the address presented by the Mysore Planters at the Installation of His Highness Chamarajendra Wodyar Bahadur, the fullest confidence was expressed that the planting community would continue to receive the same considerate treatment as it had been their good fortune to be accorded in the past.

The experience of thirty-three years of just and benevolent administration has verified the forecast then made, and has also confirmed what one of their Delegates had the distinguished honor of stating for, and on behalf of the Committee of the Representative Assembly in 1894, *viz* :—

" We rejoice in the knowledge that, with ever-watchful regard for the present and prospective requirements of the country, arrangements are constantly being made, which, working concurrently with, or in anticipation of, the wide-spread intellectual and industrial developments now steadily proceeding, are calculated effectually to safeguard the best interests of its people and to foster that spirit of reliance and contentment which it is so eminently desirable to cultivate and maintain."

In conclusion I have the honour to give expression to the matured opinion that the greatest want of Mysore is the extention of railway communications by the most direct route to Mangalore, the nearest Port on the West Coast.

This project is of the greatest possible importance, being the only plan for developing the economic and industrial properity of the Province and for safe-guarding its ever-increasing population against the horrors of another famine. It is, therefore, a most re-assuring fact that the Durbar is still in

favour of having the project carried out, and that the eminent Engineers, who originally made the surveys of the proposed line, and His Highness' present expert advisers have strongly recommended its adoption.

Having now endeavoured to afford the younger Members a brief outline of what has principally taken place in the distant past, I have the honor to refer to one of the most gratifying incidents which has quite recently occurred.

Acting with the concurrence of His Most Gracious Majesty the King-Emperor and His Excellency the Right Honourable the Secretary of State for India, His Excellency the Right Honourable the Viceroy and Governor-General has announced the enhancement of the powers, privileges and status of His Highness the Maharajah, which must be regarded as the highest compliment in the gift of the Government of India.

This announcement has given the greatest possible pleasure to all classes and communities in this Province, including the Members of this Association who are second to none in their loyalty to His Higness the Maharajah of Mysore.

GRAHAM ANDERSON.

16*th March*, 1914.

(3) By Mr. K. Thammayar, through his son, Mr. K. T. Seshaiya, B, A.

Address by Mr. K. Thammayar, thrcugh his son Mr. K. T. Seshaiya, B. A.

MR. PRESIDENT, LADIES AND GENTLEMEN,—It is a matter for no small rejoicing that you have been able to celebrate the 50th anniversary of the foundation of this Association. Organizations started by your people, be they for purposes of trade or agriculture commonly have a long lease of lite of more than one or two centuries, and it would have been, therefore, no very great matter that this Association has now had an existence of 50 years had conditions been normal. But you had to fight against adverse circumstances. In the early days of the Association, bad roads, and slow and inconvenient travelling were most unfavourable to the continued existence and prosperity of the Association. In spite of all this, that, you have been able to run the Association for the last 50 years is a matter which redounds greatly to your credit. Still more gratifying is it that the Association has extended the privilege of its membership to Indians.

I should like to notice briefly some of the important obligations which the coffee industry owes to the sagacity and enterprise of your people. Years ago, the indigenous variety of coffee ceased to grow and the industry itself was threatend with extinction. Had it lain merely in the hands of our people, probably it would have been given up. But fortunately there was a class of men amongst them that could not be dismayed into renouncing anything until all possible measures to save the situation had been tried and found wanting. Some Englishmen imported seeds from Coorg and tried them with tremendous success. All the coffee that is now in Mysore belongs to that variety. Our people do not possess the capacity for original research and experiment, though they have abilities in other directions which have won the admiration of eminent people in the West. Coming now to our days, we are confronted with problems of grave import, the solution of which offer very great difficulties and fill our minds with anxious thoughts. What with the advent of the Green-bug, the rise in the pay of coolies and the inadequacy of our labour supply, our position now is very uncomfortable and the outlook for the future is gloomy. The Green-Bug has now had

a check. The only means to overcome our labour difficulties seems to be the formation ef a Labour Department, which, if founded, will arrest the further increase of wages and will give us an adequate labour supply. These benefits will be shared almost in an equal degree by the Indian Planters, though they have done and contributed nothing towards the formation of the Labour Commission. In these ways, gentlemen, in helping yourselves, you are helping the people of this country and it is their good fortune that you are working in the same field as they.

Tremendous changes are going on all over India. A new epoch of sympathy seems to have dawned upon the British public. But the political and non-political bodies of your people have begun to show greater and greater consideration towards the Indians. Almost the highest offices under the Crown in India have been thrown open to them—clubs, and other private bodies in big places such as Calcutta, are taking respectable Indians as members. All these changes are due to the greater understanding of the Indians by the English people. We have recently learnt from the papers that the lecture by Doctor Rabindranath Tagore is creating an opinion favourable to the Indians among the Africanders, who probably judged them from what they saw of the Indians coolies that have emigrated from here. During the last fifty years opportunities have been extended for closer intercourse with the people of this country and long and continued peace, stable Government and a diligent study of the Indian languages, literature and history have tended to a more complete appreciation of its inhabitants.

Very few countries in the world offer so great a difference between the intellects of the higher and the lower classes of men as India does. You have amongst the Indians, men of the type of Doctor J. C. Bose, of whose genius humanity itself might well be proud and the Estate coolies that have barely emerged from the savage stage. Those who denounce this manifestation of sympathy and class Indians as semi-barbarians judge of them merely from what they see of the lower class of people that are around them. I am sure that you, when you go Home, will spread the correct information amongst your people and thus make them take a sympathetic interest in the welfare of our people. May this spirit of sympathy, which was inaugurated in the Guildhall speech of our present Kink-Emperor after his return from his tour in India as Prince of Wales, and nurtured by the subsequent acts of Viceroys ever gain strength and flow in an increasing swell until it permeates all classes of men, both Indian and English, and unite them in abiding love and peace.

The Honorary Secretary's Report.

MR. PRESIDENT AND GENTLEMEN,—There are 33 members representing 6,948 acres of Coffee, as against 32 members and 6,560 acres last year.

ACCOUNTS.

The accounts for the past year are before you and show a credit balance of Rs.802-11-8 and Rs.553-8-0 still due for last year's subscriptions. As instructed at the last Annual General Meeting I placed Rs.300 on fixed deposit with the National Bank, which falls due on 1st April. Our expenditure has been heavier than usual this year owing to expenses incurred for the Casket and address to the Viceroy and to laying in a stock of insecticide and sprayers for use in case of emergency by members of this Association.

I have drawn up a rough estimate of expenditure for next year, copies of which are on the table and you will see that I propose to increase the reserve fund by Rs.200.

The Planters' Benevolent Fund does not properly come into the Association accounts, but under this head I have collected and paid to the United Planters' Association Rs.240 since last April.

MEETINGS.

There have been 4 special general meetings this year in addition to the Annual General Meeting, one at Mudigere, one at Lingapur, one at Chickanhully and one at Saklaspur, all which have been well attended, and discussions on the several important subjects which have come before the meeting well maintained.

As regards the work done this year, by far the most important has been the proposal to establish a Labour Commission for Southern India. The United Planters' Association's Special meeting was held last week and I hope our Delegates will give a short report of what took place there during this meeting.

HASSAN DISTRICT BOARD.

A Government Order has been issued giving us the right to submit the name of a member for nomination, a copy of which was sent me, but I have so far had no communication from the Chairman of the Board on the subject.

Roads and Communications.—We brought the subject of the Arsikere-Mangalore Railway up at the last United Planters' Association meeting and also made it prominent in our address to the Viceroy when he visited Mysore, and there seems to be every chance that it will be made at an early date. Our thanks are due to the Honourable Mr. Barber for the energetic way in which he worked for us.

I have been in communication with several of the Public Works Department Officials during the year an the subject of the state of the roads, and have inavariably received courteous replies, but I am sorry to say without much practical effect. The present state of the Mulnaad roads is, in my opinion, due to the want of a "stich in time" and to the fact that such repairs as are done in the Mulnaad are done at the same time as those in the Maidan country, where the rainfall conditions are totally different. If the drains were cleaned out and ruts filled in before the heavy rains, instead of afterwards, it would save a great deal of expense and a large amount of inconvenience after monsoon.

Co-operation.—Your executive have tried to introduce the principle of co-operation, and a Committee is at present carrying on the work and hope shortly to be able to start in a smali way by giving an order for manures. If this is successful, and it is shown that a considerable saving can be effected by purchasing our manures in bulk, it may be possible to extend co-operation to other things.

Legislation.—The question of the introduction of a Labour Act similar to Act I into Mysore and of a Pest Act are before the Government, and any Act introduced by the Mysore Legislative Assembly will be referred to the Mysore Associations before it is passed. The Council of Mysore Planters' Association has proved very useful in enabling the 3 Mysore Associations to make unanimous representations to Government on these matters.

Scientific Department.—A series of Manurial experiments have successfully been started and carried out for the first year, and arrangements made to carry them on in future on a larger scale for a term of 5 years.

Demonstration in the use of explosives for the purpose of deep cultivation of the soil have been given and arrangements made for importing explosives into Mysore.

The Laboratory has been removed to Ootsey, and I believe our Scientific Officer is now ready to undertake the analysis of manures and soils. Of the 20 samples of soils which Mr. Frattini has undertaken to do this year over and above the necessary samples from the Kailsyndicate Experimental plots, 6, have been allotted to this Association, and members wishing their soils analysed had better apply early.

Samples of manures should also be sent in at an early date.

I have to thank you all, Gentlemen, and especially the President, Mr. Crawford, for the support and assistance I have received during the year and for enabling me to have the honour of presenting this the 50th Annual Report of the South Mysore Planters' Association,

I now place my resignation in your hands.

(Signed) M. J. WOODBRIDGE,
Honorary Secretary.

The accounts were then laid on the table and Messrs. F. W. Hamilton and E. W. Rutherford appointed Auditors.

The meeting was then adjourned till 11-30 next day.

2nd Day, 17th March, 1914.

Accounts and Finances.—The following resolutions were put and carried.

No. 1. From the Chair :

"That the Sprayers and Insecticides at present owned by the Association be sold and the proceeds credited to the General account."—Carried,

No. 2. Proposed by Mr. Lake and seconded by Mr. S. Sladen,

"That if the incoming Honorary Secretary thinks it necessary he may purchase a Typewriter up to Rs.210-0-0, and to pay a clerk up to Rs.10 per month."—Carried.

The accounts having been audited, were passed, and Budget for 1914-15 adopted.

Report of Delegates to U. P. A. S. I., Special Meeting.

Report of Delegates to U. P. A. S. I., Special Meeting—Mr. C. Lake spoke as follows.

Mr. C. Lake spoke as follows :—

I have not prepared any proper report on the Meeting held in Bangalore last week, as I have not had time since my return and also it will all appear in the *Chronicle* in due course. I will just refer to several of the most important points that concern us.

Preferential treatment in recruiting areas.—We did not pass a resolution on this matter, as both the Hon'ble Mr. Barber and Mr. Martin assured us that as far as possible this would be part and parcel of the Scheme. Mr. Martin said that this was covered by Section No. 1 in the report of the Labour Committee, which refers to the regulation of internal competition.

We dropped the matter of reduced subscription for Coffee, as we found that pressing it would be likely to wreck the Scheme, more especially as the acreage supporting it has not yet reached the minimum required to start with.

Resolutions 12 *and* 13 are very important, and everyone who has not done so should hurry up and put in their acreage, as otherwise all the

work done during the last 6 months by Messrs. Barber, Abbott. and Nicolls will have been in vain and we shall be, if anything, in a worse position with regard to labour difficulties than we are now; as we shall show outsiders that we are incapable of making any united effort to save ourselves.

You have three and a half months, gentlemen, in which to prove whether we can really call ourselves the U. P. A. S. I. or not,

Referring to the composition of the Executive Committee of the proposed Labour Department, we were not the only Association that came to the meeting imbued with the idea that the Scheme was to be run by Messrs, J. Finlay & Co. We found that nearly all the other Delegates made the same objection to the Committee, This was due to the fact that no proper explanation had been given. After hearing all that the Honorable Mr. Barber and Mr. Martin had to tell us, we were all well satisfied that the Representatives on the Committee asked for by Messrs. Finlay & Co. would be necessary, if the Scheme was to be started with the least possible delay, and without running the risk of making mistakes through want of experience.

It was distinctly stated that the Labour Department is to be a branch of the U. P. A. S. I. in the same way that Scientific Department is and that it shall be under the control of the Council of that body. To meet the general opinions of the Delegates that District Associations would not have an equal representation. Resolution 15 was passed.

With regards to the collection of the Rs.2 subscription, it was decided that it should be raised in quarterly calls of annas eight commencing from the 1st of July.

Mr. Martin is about to go Home on leave, and will return to take up his duties on the 1st of October, and the idea of making the first call in July next is to have a balance in the Bank ready when he arrives back.

Scientfic Department.—If you will read the resolutions passed, as published in the *Chronicle*, these will give the best explanation of what transpired.

The Conclusion.

The Hon'ble Mr. E. F. Barber then addressed the Meeting with reference to several points which had been raised in regard to the proposed Labour Department and was accorded a hearty vote of thanks for all the trouble he had taken in the matter, and also for his 'sportingness' in coming so far out of his way to attend the Jubilee Meeting of the Association.

Correspondence.—A letter from Mr. Edwin Hunt was laid on the table and the contents noted with satisfaction.

Mr. Graham Anderson then spoke as follows :—" I deeply regret Mr. A. Martins' remarks about what I said at the last meeting of the South Mysore Planters' Association relative to the want of Extradition being still of the greatest importance to Mysore.

" Reading Mr. Martin's speech it would at once be inferred that I was in favour of the introduction of the Madras Labour Act, whereas I have consistently opposed its introduction into Mysore "

Election of Officers.—The following were elected office-bearers for the coming year.

President	... ...	Mr. J. G. H. Crawford
Honorary Secretary	...	Mr. E. W. Rutherford.
Committee	... ...	Messrs. Thiselton Anderson, C. Lake, C. J. Hayward, A. R. Park, C. K. Pittock, A. Thomson.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

It is with pleasure that we draw attention to the rise in the Labour Barometer to 77,958 acres and trust that a further rise may be reported in our next and that the increase may be steadily maintained.

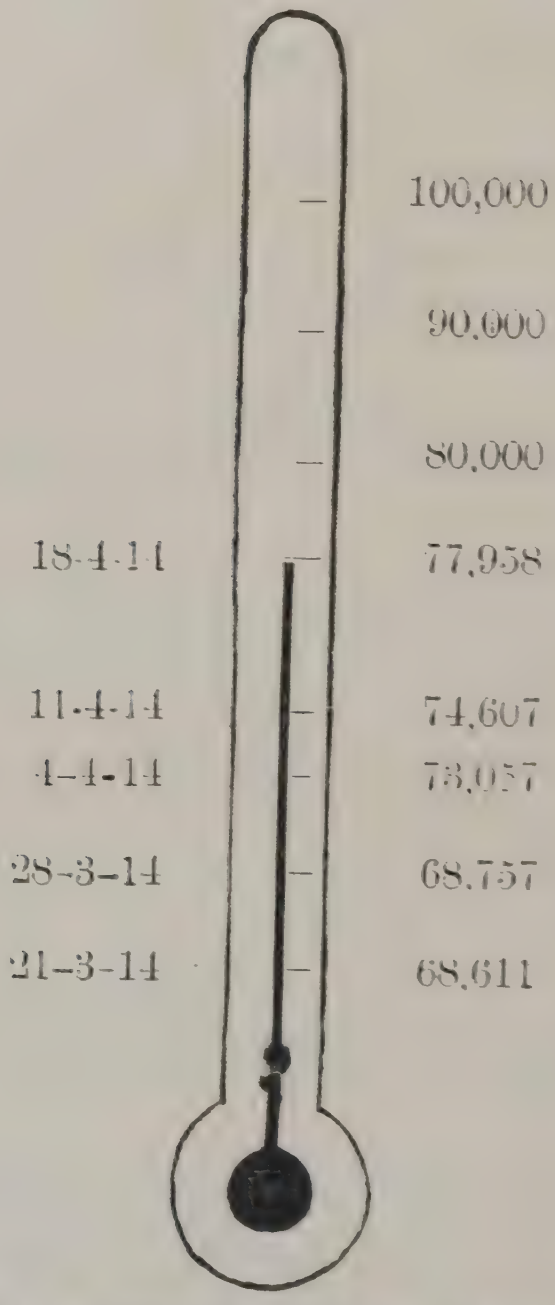
With the Labour question still so much to the fore, we reproduce an article from *The India Rubber Journal* dealing with the Labour problem in Malaya and the correspondent who contributes the article considers it necessary to have Labour Agents permanently stationed in India and gives a resumé of the duties expected from them. This means another rival in the field of recruitment and it seems almost impossible that the Planters of Southern India should wilfully shut their eyes to the absolute necessity of establishing their own Labour Department to counteract the influences of over-seas recruitment. The U. P. A. now only require 22,042 acres to attain this object, and we cannot understand the necessity for further delay. Delays are always dangerous and those first in the field will reap their reward. "If t'were done t'were well t'were quickly done." If our Labour Department is established at an early date, the difficulties of over-sea recruitment will be enormously increased and the expense to be incurred by them will be so out of proportion to the object aimed at that they may possibly see the futility of starting Labour Agencies in our midst.

We cannot close our "Contents" page without referring to the passing away of the oldest and most respected planter in Mysore in the person of Mr. Graham Anderson, C. I. E. He identified himself with every progressive movement in the Planting Politics of Southern India. He has passed away in fullness of age and time, and has left behind him a memory and an example in Mysore particularly, amongst Europeans and Natives that can never be forgotten. His life work was accomplished and one cannot read his latest speech at the Jubilee of the South Mysore Planters' Association, without emotion in the light of after events. The Editor of this Journal pays an affectionate and respectful tribute to a life-long friendship commencing from 1876.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

LABOUR IN MALAYA.

At the group of annual general meetings of plantation rubber companies, held last Autumn, the topic which seemed to interest shareholders most, and consequently the one which received considerable notice from the Chairmen of most companies, was that relating to the proposed action of the Rubber Growers' Association in regard to sales of produce and the charges connected therewith.

From the Press reports of annual general meetings held recently, it is apparent that the topic which is likely to interest shareholders at the large number of annual general meetings due to be held in the Spring, is that of labour and the rates of pay for the same.

I consequently propose to deal with this matter from the practical standpoint of one who (1) was in Ceylon when advances went up with a bound in the tea boom of the nineties; (2) has had, off and on, 10 years' experience of recruiting in the coolie districts of Southern India; (3) has been in charge of rubber estates in Malaya, and finally (4) has studied the labour methods of the Dutch in Sumatra.

Incidental references may be made to Ceylon, South India, and Sumatra, for purposes of comparison, but I wish to deal principally with what is likely to become a serious state of affairs in Malaya if it has not already reached that stage.

It is unnecessary for me to go into figures to show that never less than three-fifths of the total cost of production of rubber goes in the payment of coolies' wages; consequently in the efforts which are now being made to reduce costs, it seems to me that very careful consideration should be given to this question of wages.

I believe that the Planters' Association of Malaya has passed an official resolution not to bind its members to combine in the reduction of rates of coolies' wages; from that it is evident that the majority of planters in Malaya are either short of labour, or that, owing to their limited experience, they are ignorant of the requirements or the labour which they employ. Long experience, which is considered so immaterial by those who took to rubber planting as a profession during the boom, and who now consider themselves past masters in the art of estate management, is essential to a thorough knowledge of the coolie and his requirements.

The actual necessaries of a Tamil coolie in Malaya should cost no more than those of a Tamil in Ceylon, or a Javanese in Sumatra; consequently why should the Tamil in Malaya be paid approximately 10*d.* per day, as compared with 7*d.* per day for the Javanese in Sumatra, and 5½*d.* per day for the Tamil in Ceylon, more especially seeing that estate coolies in Ceylon and Sumatra do infinitely more work than the Tamil in Malaya?

It is true that in Sumatra the cost of importing a Javanese is an expensive matter, but once you have got him, he's on your estate under contract to work six days a week for three years, and does double the work of the Tamil in Malaya. It is also true that in Ceylon there are very large advances outstanding in the book against the Kanganies, but these are the legacies of a policy of inaction in the past, and are not being increased now, so cannot be claimed as an addition to the wages now being paid to coolies recently recruited for Ceylon.

At several meetings lately the shareholders have been informed that the labour supply is ample for present requirements, but it is not made clear to them at what cost, or what provision has been made for meeting the requirements of the future.

I maintain the labour supply in Malaya is not sufficient until planters can combine to (1) reduce the wages paid to Tamils in Malaya to the same equivalent as is being paid in Ceylon, or at any rate in Sumatra, (2) replace every Chinaman they employ by a Tamil, who can live comfortably upon half the wages necessary to a Chinaman, (3) decline to be satisfied with the amount of work done by the Malaya, who strolls up from his village about 8-30 a.m., and thinks that he has done you a kindness by remaining in the "field" until possibly 3-30 p.m.

The staple food of the Tamil is rice; if it cannot be landed on estates in Malaya as cheaply as it is in Ceylon, presumably the local Estate Agents in Malaya, who mostly hold a monopoly of the sale of rice to the estates for which they act, can give some explanation.

My own opinion is that the Tamil in Malaya is being heavily over-paid and I consider that, apart from the saving involved in the actual wages paid, a considerable reduction in wages will conduce to the welfare of the industry as well as to the Tamil himself, for the following reasons:—Firstly the Tamil is so well paid that it is quite unnecessary for him to work more than at the most four days out of the six each week, and consequently in most cases he does not do so; if you try to compel him to do so he gives you a month's notice and clears out to another estate; if he could be induced to work regularly there would consequently be a reduction of 33 per cent. in the labour force required, which would mean a considerable saving in the cost of housing accommodation and medical expenditure.

Secondly, a reduction in wages, would mean that the Tamil could not afford to ruin his health with drink as he is doing at present; I venture to say that the amount of ill-health in Malaya could be rendered largely preventable, and what is due to climate considerably lessened, by making access to cheap liquor less easy to the Tamil coolie. Neither the Chinaman nor the Javanese, and they are both, of course immigrants, become so prostrate with malaria and bowel complaints as the Tamil, the reason being that the Chinaman's vice is opium, not liquor at present, and that the Javanese does not make a practice of drinking to excess, but gambles his earnings away.

In spite of this licensed liquor-shops are multiplying in the vicinities of Malayan estates, the reason given (in a country whose Government is rolling in wealth) being that the cost of prevention of illicit sales would otherwise be prohibitive!

I am quite prepared to admit that it was necessary to pay high wages to Tamils in the first instance, as Malaya had earned such a bad name, for Malaria, etc., in the days before the country was properly opened up, and when the unfortunate planter had not the money to house and treat his coolies properly; I am also prepared to admit that up to now it has been impracticable to reduce wages, for reasons which must be obvious to all who have any idea of the state of competition for labour from 1909 until the middle of last year.

That crisis was survived by inducing Malaya to work on payment of double rates for half a day's work, and by drawing upon the Chinese labour employed in the tin mining and Tapioca industries. If proof of this is

required, it is only necessary to turn up the Annual Financial Review of 1913 in *The Times*, from which it will be seen that the Malayan export of tin steadily fell from 50,600 tons in 1908 to 44,148 tons in 1911, whereas one would have expected the same to rise, seeing that Chinese mining methods are so primitive that the output could rapidly have been increased, if labour was available, so as to secure the rising prices of the metal, which "jumped" from £10 19s. per picul in 1911.

Similarly with tapioca the Malaya export fell from 32,860 tons in 1908 to 27,194 tons in 1912, although the price was gradually rising the whole time, until in 1911 it reached a record in recent years of 11 per picul in Singapore. The big Chinese tapioca growers had realised enormous sums from the sale of their rubber estates to European companies, and consequently had ample funds available to plant up large areas of tapioca, from which a crop can be harvested in 15 months from planting. They did not plant up new areas simply because they were afraid to pay the rates necessary to get their Chinese coolies back from the rubber estates, to which they had been noticed by the offers of extravagant wages.

This is how the "planting" crisis was survived at a time when costs were of no consideration. It is unnecessary to go into long explanations to show that the "crop" crisis cannot be got over in this manner, even if the available Chinese and Malay labour was sufficient for the purpose, which it will not be.

Companies have to produce this rubber at a profit, which they cannot do at present prices, if rates of pay are raised. Consequently if labour is insufficient, other inducements have to be held out to attract it. Unless the situation is brought under control by a proper organisation, the inducement which in many cases will be offered is that of higher advances, as was the case in Ceylon in the tea boom. Though this course would be fatal, it can be adopted without raising the suspicions of inexperienced shareholders because coolie advances are not charged in the yearly profit and loss account, although they are never likely to be recoverd, but appear as an asset in the balance sheet, and consequently do not raise the cost of production.

The method of the Kangany is so simple that one feels almost ashamed to relate how easily the Ceylon planters were gulled years ago. Briefly, the process was as follows:—The Superintendent is short of labour, and has been told that unless he can get in his crop his services will be dispensed with. The Kangany having (say) 70 coolies on the estate, and thoroughly understanding how the Superintendent is situated, comes up and says that he has 50 more coolies in his village and wants $1,000 to secure them, the idea being that the advance is given by the Kangany to the coolies so that the latter may leave some money behind with their relatives to "keep them going." The Superintendent "jumps at" the chance, although he probably knows nothing of the standing of the Kangany in the village. Nine times out of ten the Superintendent is lucky if he gets in five coolies out of the promised 50, the money having gone to increase the Kangany's landed property in India, which by the way, is in sombody else's name. It is useless to say, "Why not run the Kangany in?" Even if you could get a conviction the money is gone, and to sue a Tamil of this class in the Civil Court is simply to throw good money after bad.

Supposing, however, the Superintendent declines to give the $1,000, the Kangany simply says that he must go and get the money elsewhere, as he has mortgaged his land in his village for Rs.500, so as to be able to give the

coolies Rs.10 each as a "retainer" until he can come over and fetch them; this results in the Kangany going to a neighbouring estate, which is sure to be also short of coolies, and offering the Superintendent there to bring 70 coolies in a month, and a further 50 within three months if he is given $2,000, the extra $1,000 being, so *he* says, to pay debts which his 70 coolies owe in the Bazaar. He gets the money, gives his 70 coolies $5 apiece, and they promptly give the Superintendent of the estate on which they are employed a month's notice, so that the unfortunate man, instead of having the prospect of an additional 50 coolies coming in, is faced with immediate loss of 70 coolies.

There are innumerable ramifications of this system of extortion, which naturally increases by leaps and bounds in proportion to the demand for labour, but I have written sufficient to show how powerless employers are to resist these demands unless they are well organised and have the situation under control. The only way in which they can succeed is firstly by having a sufficiency of labour at reasonable rates for present requirements, and secondly by building up organisation in normal times which can expand rapidly in a crisis, and thus provide adequately for any urgent demand which may spring up at short notice in the future.

The ordinary Superintendent has absolutely no knowledge of the conditions under which his Kanganies and coolies live in their native villages, simply because he has never had the time nor the opportunity to go to South India, much less of spending a few weeks in the coolie districts. If he does go over there to hunt up coolies, he probably wastes an enormous lot of money, and returns in disgust at having possibly collected only 20 coolies, whereas he expected a couple of hundred, the reason being that he has no experience of the business and no reliable local staff to advise him. The Malayan planter is at an even greater disadvantage, as he talks of a kind of bastard mixture of Tamil and Malaya, which is totally unintelligible to the village coolie at first.

It is consequently necessary to have Labour Agents, representing the various estates, permanently stationed in India, whose duties would be:— (1) To ascertain the standing of each Kangany in his village so as to be able to advise the Superintendent how much to advance him, and what reliance to place upon him; (2) to see that the Kangany spends a reasonable portion of the money given to him in advancing coolies, the most satisfactory way being for the Superintendent to remit the bulk of the money to the Agent, who pays it over after he or one of his staff has actually seen the coolies to be advanced; (3) to report to Superintendents upon the condition of the labour supply in the various coolie districts, so that the Superintendents may know when it is best to send over Kanganies to recruit, the seasons varying greatly in different districts; (4) to put every obstacle in the way of the unscrupulous professional native recruiter, who collects Bazaar "loafers" and sells them to so-called Kanganies, who are sent over to recruit, but have no influence or connection in their villages; (5) to encourage and help the Kanganies to recruit genuine agricultural labourers in their own villages, and thus build up a sound connection of family people, who will settle upon the estates to which they emigrate, as they have done in Ceylon.

With information and assistance of this nature at his disposal, the Superintendent is in a position to judge for himself, instead of having, as at present, to depend upon the doubtful statements of his Kanganies. Further, should the Superintendent be very short of labour, and consequently think it advisable to send over an assistant to hurry up the Kanganies, there will

be an organisation ready to render the assistant every assistance from the day he lands in India, which is bound to make his work much more effective, and enable him to complete it in considerably less time, and at a much smaller cost than would otherwise be the case.

One thing has got to be realised, and that is that the Kangany is a necessary evil; he cannot be done away with, as he is the only person who can make a success of recruiting, but he can and must be kept under control, which is impossible if he is sent 2,000 miles over the sea to his village, with $1,000 in his pocket, on the promise of bringing 50 coolies, and if there is nobody there to see how he spends it.

The planting industry in Malaya has sprung so rapidly, and has become such a vast enterprise, that it is impossible to take Ceylon as an example of how the labour question should be tackled. Whereas the present planted area in Ceylon took decades to bring under cultivation, the huge area of rubber in Malaya has been developed in as many years.

In Ceylon a Labour Commission was inaugurated by the Planters' Association in 1904, which has been improving and enlarging its organisation ever since. It is run for the whole Island by a Commissioner, with the necessary staff of European assistants.

In Malaya, however, I am sure that there would be insufficient combination to run a Commission on the same lines, in addition to which the industry having developed so quickly, the work to be undertaken will be considerably heavier than it was in Ceylon, seeing that, in the latter Colony the influential Kanganies and their capabilities had been known to their estates for a generation or more before the Commission was started.

In Malaya it would probably be best for the various Estate Agents either in Europe or Malaya, to employ a Labour Agent for the estates which they represent, such estates being debited with the cost in proportion to their respective cultivated areas. In some cases it would be possible owing to their size, and perhaps more satisfactory, for three or four large companies to join together and employ a Labour Agent, who should, with a staff varying according to season of from 10 to 20 native assistants, on salaries of up to £50 per annum, be able to supervise the labour supply for an area of from 25,000 to 35,000 cultivated acres.

The Labour Agent should carry on the work which I have already outlined, and should spend a month or so in the year on the estates, getting a knowledge of local conditions and the amount of control exercised by the various Kanganies over their coolies.

It is possible that additional labour will not be considered necessary this year, but this will give the Labour Agent more time to organise, and get a knowledge of the various Kanganies, both on the estates and in their villages. If the scheme is only started when the crisis arises it will be nothing like so effective as it would be if it was organised in such a way as to be able to expand sufficiently to be immediately able to cope with any difficulty directly it arose. The expenditure of a few thousand dollers now by each estate on such a scheme will mean the saving of hundreds of thousands of dollars in lost advances later on, and will also possibly prevent a labour shortage in 1916.

I could name a dozen or so of old planters who are now on the boards of influential companies of excellent standing, and who will endorse every word that I have written, but they will be over-ruled on the score of expense by those members of their boards who have no practical knowledge of the

labour question, and are straining every nerve to reduce the present cost of production.

The judicious curtailment of expenditure so as to bring down this year's cost of production is worthy of all praise, but to starve an estate of the funds now required for the provision of an organisation necessary to cope with future difficulties, which are otherwise bound to arise, will only react upon the cost of production of the future.

This year very few new trees are being brought into the tapping round, which means a considerable reduction in the cost per lb. of tapping; for the same reason the labour force is not being increased to any extent, thereby resulting in a saving in expenditure under various headings. The mere fact of these reductions being possible this year makes it all the more certain that these charges will go up next year in the same proportion that they have gone down this, as they are items of expenditure which are bound to be incurred at some time or other.

If, on top of these increased charges in 1915, you have difficulties with labour necessitating the establishment of labour agencies in South India at short notice, and consequently at a considerably heavier cost than if they had been organised slowly, the cost all-in at the end of 1915 is likely to be as heavy as it will have been at the end of 1913, which with the largely increased supplies coming to hand at probably lower prices, will cause a big drop in dividends, and probaly result in another slump in the share market.

I admit that I am looking ahead a bit, but if similar precautions had been taken a couple of years ago in respect of sale methods, the industry would not have fallen into the ghastly mess from which it is only just beginning to recover. Moreover a big shortage in labour, resulting in the raising of rates of pay and advances in competition, will take a good deal longer to rectify than would an error in the methods of sale of the produce.

Malaya's most serious competitor is Sumatra, where there is no export duty, no coolie-poll-tax, and in most cases a quit-rent of not exceeding 1s. per acre as compared with a quit-rent of 9*s.* 4*d.* per acre, an export duty of 2½ per cent., and a heavy coolie poll-tax on most estates in Malaya. Under such circumstances can any sane individual think it possible that Malaya can afford to pay its labour 30 per cent. more than is paid in Sumatra, where there are hundreds of thousands of acres of excellent land available for further extension?

For these reasons I look upon a reduction in wages to Tamils in Malaya as a foregone conclusion, which will of itself necessitate the formation of labour agencies in South India so as to prevent a crisis when the Kangany thinks that labour is sufficiently scarce to make it safe for him to "put the screw on" the Superintendent.

It is useless to start these Agencies until it has been decided at what rate the maximum wage of a Tamil coolie in Malaya is to be fixed, as it is not desirable for the Labour Agents to have to reduce the rate later on, when there might be a slight shortage.

The rate of wage is not a matter which should be left to the Planters' Association of Malaya, as that is an Association of Superintendents, who are naturally averse to taking the risks attached to an all round reduction of rates. It is a matter which will have to be decided by an Association of those who are responsible to the shareholders for the cost of production: it is obvious that I allude to the Rubber Growers' Association. In my opinion

the members of the R. G. A. should bind themselves to send out instructions to those in charge of their estates in Malaya to the effect that on and after September 1st of this year the maximum wage payable to Tamils in Malaya is not to exceed so many cents per diem for all coolies employed in the "field." It is impossible to prevent loopholes for evading this agreement, which is, perhaps as well, as it enables those estates which are in unhealthy localities, or situated far from Bazaar, to make special concessions to their coolies in the way of half-a-wage to go to Bazaar, extra doles of "sick" rice, issue of rice at under cost price, and so on. "It will all come out in the wash" in such cases at annual meetings, when the directors have to explain why the cost of production is higher than elsewhere, but that is a matter which does not concern the industry as a whole.

What is of importance and what does concern the whole industry, is to make it possible for reasonably situated estates to put their rubber f. o. b. at a cost which will compare favourably with that of rubber shipped from other countries. This can only be done by reducing the present exorbitant and unnecessary standard of wages paid to Tamils in Malaya.

Ceylon, which has been a planting country for the last 50 years has found it necessary this year to increase the funds of its Labour Commission so as to provide for an annual expenditure of a quarter of a million rupees per annum, apart from what is spent by estates privately.

Even the planting districts of South India, which practically surround the labour districts from which Malaya recruits its Tamils, have found it necessary to start a Labour Commission, one of the reasons given in the pamphlet which its Association has circulated to the districts concerned being "the immense advantage to be gained by the planting industry of South India in the reduction of the huge amounts yearly lost in bad advances, which in many cases will be a severe shock to proprietors and to shareholders in companies in the near future."

With these examples from countries which had thriving planting industries before Malaya was hardly heard of, can Malaya afford to proudly stand aloof because she thinks that she has not yet got an advance question to deal with ?

The Kanganies advance boom will only make its appearance when the Superintendent is least able to withstand it, and it will become acute in proportion to the cultivated area upon which there is a labour shortage.

I must apologise for the length of this communication, but the subject is one of great importance to all who have invested in rubber in Malaya. I enclose my card, and am etc.—(*The India Rubber Journal.*

Federated Malay States.

Rubber Exports during 1913.—The following figures of the exports of cultivated rubber from the Federated Malay States during the year 1913 are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for 1912 being added for purposes of comparison :—

	1912.	1913.
	Lbs.	Lbs.
December	3,693,929	5,859,840
January-December ...	34,732,415	52,557,400

—*The Board of Trade Journal.*

RUBBER.

The Utilisation of Para Rubber Seed.

In order to ascertain the value of the oil for various industrial purposes, samples have been distributed by the Imperial Institute to a number of firms for technical trial. It has been pointed out already (*loc. cit.*) that the cake left after expressing the oil from the kernels would probably be suitable for use as a feeding-stuff, and with a view to confirming this by actual feeding trials, supplies of the cake have been forwarded to the South-Eastern Agricultural College, Wye, so that feeding trials might be made. The results so far obtained in these two technical investigations are summarised in the following pages, to which are added the results of examination of samples of the kernels, cake, and oil forming part of experimental consignments. An account of previous samples examined at the Imperial Institute is given in this Bulletin (1903, 1, 156; 1911, 9, 286).

TECHNICAL TRIALS OF THE OIL.

Paint and Varnish Manufacture.—Samples of the oil were furnished to three firms for trial in the manufacture of paints and varnishes. One firm states that the oil proved very satisfactory for the purposes, being about equal to linseed oil. They added, however, that their experiments were not carried on long enough to determine whether paint made with para rubber seed oil lasts as long as that made with linseed, but they would not hesitate to adopt it in part of their manufactures, provided it was obtainable at an acceptable price. They stated that they would be prepared to pay 25*s.* to 30*s.* per cwt. for the oil if it were obtainable in considerable quantity (July 1912).

A second firm stated that the drying power of the oil was 30-40 per cent. less than that of linseed oil. They found that it dried with a "flatter" surface and considered that it would not show as good results in paint as linseed oil.

In the third case the oil was found to dry more slowly than linseed oil with the usual "driers" and to be more readily saponifiable than the latter oil. The opinion was expressed that as linseed oil was quite satisfactory for paint and varnish manufacture, it was unlikely that it could be replaced by Para rubber seed oil as long as it was obtainable at reasonable prices and in large quantities.

Linoleum Manufacture.—Four separate trials have been made with the oil for this purpose.

A German firm stated that Pará rubber seed oil is now completely satisfactory as a substitute for linseed oil in the manufacture of linoleum, but that more extensive trials are necessary before a definite conclusion could be reached. They would, however, be prepared to consider the matter if the price of the oil were less than that of linseed oil.

In a second case the results were stated to be unsatisfactory. Some difficulty was experienced in drying the oil, and two manufacturers, who were supplied with samples of the oil by the firm conducting this trial, considered that it is of very little value for this trade.

Another firm stated that the iodine value of the oil is much too low to enable it to be used as a substitute for linseed oil for the manufacture of linoleum, but they expressed the opinion that it might take the place of soy bean oil for making paint oils, but this would depend on its price.

The fourth firm also considered it to be unsuitable for linoleum manufacture.

Soft Soap Manufacture.—A firm of oil seed crushers stated that the oil would be very suitable for the manufacture of soft soap, and for this purpose would be about equal in value to linseed oil or cotton oil.

Manufacture of Rubber Substitutes.—One firm to whom a sample of the oil was submitted thought that it would probably be suitable for the manufacture of rubber substitutes, but a second firm stated that their experiments did not show that the oil could be employed to any advantage for this purpose.

Conclusions.

It has been pointed out previously in this Bulletin (*loc. cit.*) that though Para rubber seed oil is a drying oil it dries less quickly than linseed oil and is therefore inferior to this oil for those industrial uses to which linseed oil is particularly suited. When linseed oil is high in price, however, it has to be replaced by oils that are intrinsically inferior to it for these purposes, and in such cases Pará rubber seed oil would be a valuable substitute. The defects of Pará rubber seed oil from this particular point of view are, however, advantageous for other industrial purposes, since they enable it to be used to some extent in industries in which the employment of linseed oil is inadmissible. On the whole, the results of these trials clearly indicate that there would be no difficulty in finding a market for Para rubber seed oil, provided it can be put on the market at a suitable price and in large quantities. In this connection mention may also be made of the fact that the new process of "hardening" liquid oils by hydrogenation, if successful on an industrial scale, will open an entirely new market to oils of the Para rubber seed type.

Feeding Trials with Para Rubber Seed Cake.

Two series of feeding trials have been carried out at the South-Eastern Agricultural College, Wye, with Pará rubber seed cake, which formed part of commercial consignments imported, or made experimentally in this country and courteously furnished to the Imperial Institute by the importers.

First Series.

About 4 cwts. of cake imported from Rangoon were received in February 1911. A portion was analysed at the Imperial Institute and gave the following results, to which is added for comparison the average composition of linseed cake:

	Para rubber seed cake Per cent.	Linseed cake Per cent.
Moisture	6·91	11·6
Crude proteins	29·93	29·50
Consisting of:		
True proteins ...	27·03	—
Other nitrogenous substances ...	2·90	—
Fat	17·68	9·50
Starch, etc. (*by difference*) ...	35·97	35·54
Fibre	4·82	9·10
Ash	4·69	5·20

The ash contained:

	Per cent.
Lime CaO	5·03
Phosphoric acid P_2O_5 ...	33·52
Potash K_2O ...	34·89

No saponin or alkaloids were present in the cake, and if any cyanogenetic glucosides were present the amount was less than necessary to yield 0·01 per cent. hydrocyanic acid.

It should be pointed out that this consignment of Para rubber seed cake was not of normal composition, inasmuch as it contained nearly 18 per cent. of fat, which is at least twice as much as would be left in the cake under ordinary commercial conditions. The composition of the second consignment more closely represents the cake which would be marketed under ordinary conditions when the kernels are being expressed regularly on a large scale.

The report on the feeding trials conducted at Wye with this consignment of cake was as follows:—

Cows.—A quantity of the cake was moistened and fed to cows. All except three, which are usually averse to new foods, ate it readily. The cake was dry and powdery, and was moistened before feeding for this reason. It was found to absorb about its own weight of water, and was more appetising in this state than when fed dry. Several cows refused it in the dry state, but ate it readily when moist.

Three cows received the cake daily for five days, getting 4 lb. each day. They all ate it readily, and no scouring or binding effects were noticed, nor did the milk or cream appear affected in any way.

Sheep.—The cake was fed in a dry state to sheep and was eaten fairly readily. Some sheep ate their full allowance when it was mixed with other foods, but apparently had less liking for it when fed alone. No exceptional effects were noted.

Second Series.

A more extended feeding trial with 1½ tons of Pará rubber seed cake, made experimentally from kernels imported from Ceylon, was carried out at the South-Eastern Agricultural College during the latter part of 1912 and the beginning of this year. A sample from this consignment was examined at the Imperial Institute and gave the following results, which are compared with the average figures for linseed cake:—

	Para rubber seed cake.	Linseed cake.
	Per cent.	Per cent
Moisture	8·75	11·6
Crude proteins	30·19	29 50
Consisting of:		
True proteins	24·85	—
Other nitrogenous substances ...	5·34	—
Fat	8·71	9·50
Starch, etc *(by difference)* ...	41·74	35·54
Fibre	5·01	9·10
Ash	5·60	5·20
Nutrient ratio	1:2·0	1:2·0
Nutrient ratio	139	133

Cyanogenetic glucosides were present in this sample, which yielded approximately 0.02 per cent. of hydrocyanic acid.

This cake probably represents fairly closely the material which would be marketed if Para rubber seed kernels were worked industrially on a large

scale, and its composition may therefore be fairly discussed in comparison with that of linseed cake, which is the feeding cake chiefly used in the United Kingdom

It will be seen from the foregoing table that Pará rubber seed cake is strikingly similar to linseed cake in composition, and that what difference there is, is in favour of the former. The chief difference is in the quantity of "fibre," which is only 5·01 per cent. in the case of Pará rubber seed cake, against 9·10 per cent. in linseed cake. It is to be remembered, however, that the item "starch, etc." is a "difference" figure, and probably represents to a large extent different carbohydrates in the two cases. Thus in the case of linseed there is much mucilage, which accounts to some extent for the hardness of linseed cake. Pará rubber seed cake, on the contrary, is soft and inclined to crumble easily, so that it probably contains but little mucilage. Like linseed cake, Pará rubber seed cake may yield small amounts of prussic acid, and the amount furnished by this sample is rather high, but as will be shown later it produced no ill effects on the animals fed with the cake.

The following is a summary of the report received on the feeding trials conduct at Wye with this cake:—

Sheep.—A group of store tegs accustomed to trough feeding were used for the experiment. The smallest admixture of the rubber seed cake with the usual concentrated foods was, however, detected by the sheep, and the cake was left uneaten, Even when the total food supplied to the sheep was reduced below maintenance requirements, and this low ration was continued for a fortnight, the sheep refused to eat the rubber seed cake. Mixtures of the cake and various other concentrated foods were also tried without success. Older sheep similarly refused the food, and in fact all attempts at feeding sheep with this sample of Pará rubber seed cake failed.

Young Cattle.—The cake was fed to a pair of two-year old fattening heifers, which readily ate the food. The quantity of cake was increased gradually to 8 lbs. per head per day, but this caused pronounced scouring, and even 5 lb. of Pará rubber seed cake eaten daily with 56 lb. of mangolds produced a slightly laxative effect on these immature animals; the latter quantity of cake should therefore not be exceeded, as a rule, for such cattle. Further experiments with another batch of two-year-old beasts confirmed this conclusion.

Two of the beasts were killed at the conclusion of the experiment: the butcher reported the carcases to be of first-class quality, and the beef of excellent flavour. One of these heifers had received 6 lb. of the cake per day for ten weeks.

Dairy Cows.—Six barren cows with an average milk yield of 1½ gallons per day were used for this test, and were fed with increasing amounts of the cake, until at the end of a week each animal was receiving 14 lb. of cake per day. The cake was the only concentrated food supplied to the animals, and the ration was continued for six days without any marked change in the animals' excreta. The ration being richer than that previously allowed, the yield of milk rose, but the percentage of fat in the milk was practically unchanged. Butter was made from the milk produced during the first three days and again from that of the second three, and in each instance the texture, smell, and flavour of the butter were considered to be unaffected by the change of concentrated food. The butter

was of slightly paler colour than that obtained from the same cows on a concentrated food ration of bran, dried grains, oats, and Egyptian cotton seed cake.

Pará rubber seed cake can thus be safely fed to dairy cows without fear of tainting the milk or adversely influencing the butter. Even the large quantity of 14 lb. per head per day seems to be without noticeable effect when fed to mature cattle.

Full-grown fattening Cattle.—The cows mentioned above were fattened while still in milk, the daily quantity of rubber seed cake being reduced from 14 lb. to 8 lb., and 4 lb. of other cake added. The cows remained in a very healthy condition, and maintained a high milk yield until they were intentionally dried off about a month before sale to the butcher. The increase in live weight over an average fattening period of nine weeks was 1·7 lb. per cow per day, and the milk yield over the same period was 0·85 gallon per cow per day, the cows being in milk an average of six only of the nine weeks. Pará rubber seed cake thus appears to be a valuable fattenning food for cows, producing very satisfactory increases in weight in mature animals, and giving rise to no ill effect even when the feeding is continued for a considerable time.

The value of Pará rubber seed cake as a food for cattle has been clearly established by these experiments As the first sample of Pará rubber seed cake was eaten fairly readily in a dry state by sheep it would appear that the aversion of sheep to the second sample must have been due to some peculiarity which it possessed, or to some idiosyncrasy in the sheep used, and it will not be desirable to draw a definite conclusion as to the unsuitability of Pará rubber seed cake as a food for sheep without further trials.

Commercial Consignment of Para Rubber Seed Kernels.

As a result of the work done at the Imperial Institute on Pará rubber seed kernels, a considerable amount of interest in this product has been aroused among planters in Ceylon and the Federated Malay States, and among oil seed crushers and others in the United Kingdom, and several experimental consignments of the kernels, oil and cake have been received and sold in the United Kingdom. The following particulars of such a consignment of kernels crushed in the United Kingdom are of interest in this connection.

"Kernels as received from Colombo." This consisted of dried kernels in fair condition, though a few damaged kernels were present. On examination at the Imperial Institute the kernels were found to yield 45 per cent. of a pale yellow liquid oil with an acid value of 34·1.

"Cake as received from the crushers." This consisted of clean, friable, buff-coloured cake, which was found to contain 11·2 per cent. of a semi-solid oil, obviously composed principally of free fatty acids.

"Extracted oil."—This was a clear, liquid, brown oil, which gave the following results on examination, compared with those for samples of Pará rubber seed oil from kernels in good condition previously examined at the Imperial Institute:—

	Present sample.	Previous sample.
Specific gravity 15oC.	... 0·925	0·925 to 0·930
Acid value	... 40·9	10·7 to 16·8
Saponification value	... 188·5	191·8 to 192·1
Iodine value per cent.	... 143·3	128·3 to 131·4

The oil thus generally resembled the samples previously examined at the Imperial Institute. Its acidity, however, was high, and this factor was apparently the cause of the "feeding up" stated to have been observed in paint made with the oil. Experiments carried out at the Imperial Institute support this view, since the oil as received, when ground with white-lead, gave a pasty, stiff paint which did not spread well, whilst oil from which the free acid had been removed gave a paint which remained fluid and could be spread easily.

It has been found at the Imperial Institute that the acid value of the soil is usually higher when the latter has been prepared from old or damaged kernels, and it is possible that the rather high acid value in this instance is due to the use of kernels that had been stored for some time. The acidity is principally due to the condition of the seed which yielded the oil (see above); the increase from 34·1 to 40·9 being probably due to enzyme action during the crushing process.

The oil did not appear to contain any lipolytic enzyme, as its acidity did not increase on keeping, even under conditions favourable for the action of an enzyme.

In a note published in the Tropical Agriculturist (1913, 40, 311) Wicherley calls attention to the fact that Pará rubber seed has been sold in Ceylon at prices which yield a profit of about £1 per ton to the planters. A large firm of oil manufacturers in England valued the kernels at about £9-10s. per ton, and stated that there would be no difficulty in disposing of 1,000 tons. Some difficulty seems to be experienced in separating the kernels from the shells, while the kernels are said to be liable to attack by insects unless thoroughly dried.

Several thousands of tons are reported to have been offered for sale in the Malay States, but the prices asked were prohibitive for export purposes. —*Bulletin of the Imperial Institute.*

Coffee.

The terminal market has again fallen sharply, bringing the price almost down to the lowest point touched last August. The continued heavy receipts are the main cause of this and an estimate from Santos that they would amount to half a million bags during March, and that there are still two million bags left in the interior, had a very depressing effect. At the same time it must be borne in mind that a large crop was expected, and that nothing fresh has occurred to improve the prospect for the next crop, which is still estimated to be one and a half or two million bags less than is required for consumption. At the moment, however, there is plenty of Coffee available for trade purposes. The crops of mild descriptions are coming forward very freely, and with large supplied from nearly all the Central American countries and an increasing quantity of Java Robusta and East African, there is no immediate fear of a shortage. The home trade sorts have been offered freely, and with importers ready sellers, prices have given way 1*s.* to 1*s.* 6*d.* per cwt., the only kinds that maintain their value being really fine Costa Rica and Mysore, of which there will evidently be a scarcity this season. The new Naidoobatum may be expected next week, and the crop is reported to be a fairly large one.—*The Produce Markets' Review.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether and is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part in 20 of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them. or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzene. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent, if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,

The United Planters' Association of Southern India,

BANGALORE,

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

Up to the moment of going to print an additional 1,862 acres have given definite support to the Labour Department and the Barometer reads 79,820 acres. Ten more weeks only remain to subscribe 20,180 acres or an average of 2,000 acres weekly. We are getting within measurable distance of the desired goal. It remains for those who are still waverers to crown the edifice that the Association has worked for so steadily and so consistently and unite all District Associations in closer and firmer bonds.

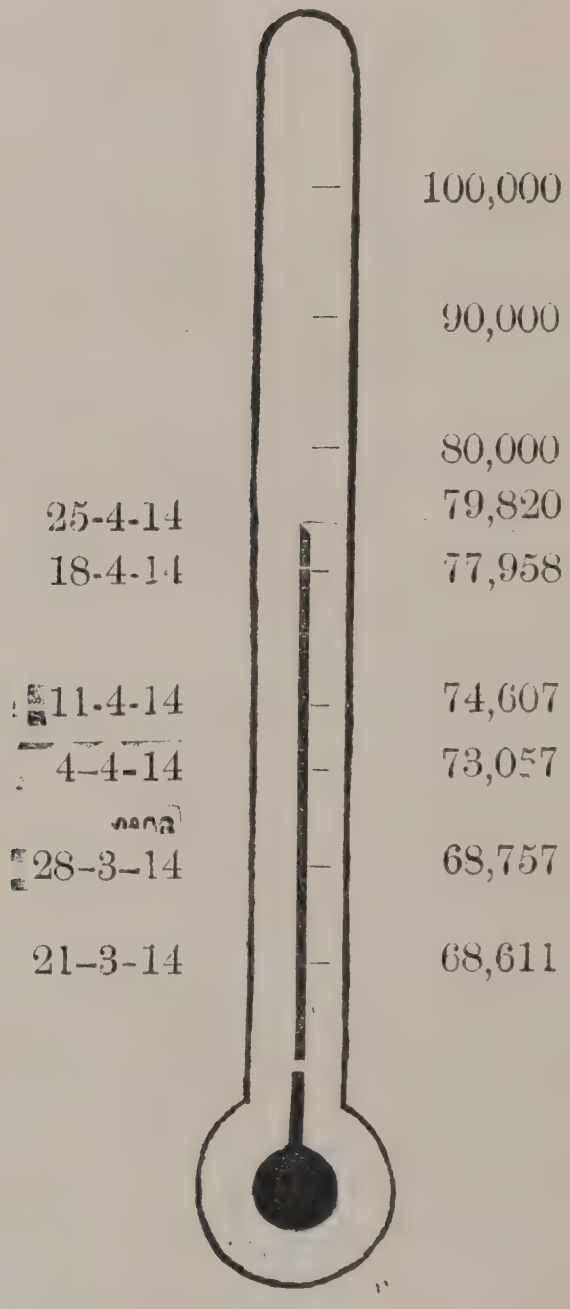
We publish the proceedings of the Central Travancore Planters' Association, and in connection with the Barometer of the Labour Department, we would call attention to the Delegates' report at the special General Meeting and wish once again to emphasize the fact that the Labour Department once established will be under the absolute control of the U. P. A. The valuable information given by Mr. Richardson regarding the Straits will, we trust, bear fruit, and that those who have lulled themselves into he belief that Malayalams will not emigrate, will rouse themselves from their sense of false security. Mr. Richardson's last few words on the Labour Department (page 234) shou'd give food for serious reflection. Shareholders of Companies are taking a more lively interest in their meetings and are putting pertinent questions, and we do not see how this question of labour advances which forms a portion (and a most important portion) of the duties of the Labour Department can escape adverse criticism. By union only can this serious question be solved. We read only lately of the awakening of shareholders, when at a recent meeting of a Rubber Company two retiring Directors sought re-election, a shareholder who had been putting some searching questions said he would second the re-election of one of them, but he did not think the other had done them well. This sort of out-spoken criticism is very good and can only have one effect and that not detrimental. We are indebted to *Greniers Rubber News* for this information.

The Labour Department so overshadows all other matters that we can only call attention to the other interesting articles appearing in this week's issue.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

Coorg Planters' Association.

General Meeting of the Subscribers to the Scientific Officers, Assistant Fund, held in the North Coorg Club, Mercara, April 9th, 1914.

PRESENT.—Messrs. C. E. Murray-Aynsley (Chairman); P. G. Tipping (Honorary Secretary); W. M. Ball, Talbot Cox, C. Elsee, G. L. Newberry, A. J. Wright, W. B. Wright, E. L. Mahon, W. A. F. Bracken, C. C. Maclean, H. G. Grant, H. M. Mann, F. Hannyington (Commissioner of Coorg). *Visitor.*—G. Bevell.

Mr. Mann, Honorary Secretary, Sc. O. A. Fund brought forward the business of the meeting, and after some discussion, the following proposition was brought forward by Mr. Mahon and seconded by Mr. Ball:

> "That the appointment of an Assistant to the Scientific Officer be "held in abeyance and that instead of the present subscription of "12 annas per acre, the subscribers to this Fund do pay 4 annas "per acre, 2 annas of this to be held in reserve, as an emergency "fund and the other 2 annas being paid to the U. P. A. S. I. as "heretofore."—Carried.

Mr. Ball seconded by Mr. Maclean brought forward the following proposition which was also carried.

> "That the local Government be asked to hold the Sc. O. A. grant of "Rs.1,500 in abeyance pending the appointment of an Assistant "to the Scientific Officer."

Proposed by Mr. Ball and seconded by Mr. Bracken, "That the 3rd call payments be credited to the 4 anna fund and that the 2nd call towards the Sc. O. Assistant Fund be made on those that have not already paid it."—Carried.

Mr. Mahon here took the opportunity of mentioning the proposed visit of Mr. Bainbrigge-Fletcher, to Coorg, and said he would be happy to arrange his tour if those wishing to see Mr. Fletcher on their Estates, would communicate with him.

A hearty vote of thanks was accorded to Mr. Murray-Aynsley, the late President and to Mr. Ball, the late Honorary Secretary for their past invaluable services, all joining in wishing them *bon voyage* and good luck.

A vote of thanks to the Chair terminated the meeting.

P. G. TIPPING,
Honorary Secretary,
Coorg Planters' Association.

Central Travancore Planters' Association

The First Quarterly General Meeting of this Association was held at Stagbrook Bungalow on Saturday, April 4th, at 10 a.m.

PRESENT.—Messrs. H. C. Westaway (Chairman), J. A. Richardson, T. C. Forbes, J. H. Ellis, J. S. Wilkie, A. R. St. George, W. H. J. Milner, R. Goldsmith, F. W. Winterbotham, H. C. Bracher, K. D. Scoble Hodgins and R P. Roissier (Honorary Secretary).

The notice calling the meeting was read.

The Proceedings of the last Meeting were taken as read and confirmed.

The Chairman, Mr. Westaway, said: "Gentlemen, before proceeding with the business of the day I wish to thank you very much for the honour you have done me in electing me as your Chairman and I will do my best for the Association."—(Applause).

Correspondence.—Read letters of the 14-2-14 and 26-3-14 from the Honorary Secretary, Lady Ampthill Nursing Institute.

The Hon. Secretary was instructed to again write to the Hon. Secretary, I. A. N. I. informing him that the Members of this Association still adhere to the proposalcontained in the Resolution passed at the last Meeting.

Proposed by Mr. Ellis, "That the Hon. Secretary do write to all Planting Associations asking them to support the Resolution as passed at the last Meeting." Seconded by Mr. Winterbotham. Carried unanimously.

Read letter from Mr. Scoble Hodgins *re.* protection of Game.

Resolved that this letter be forwarded to the Honorary Secretary, Game Preservation Committee.

Read letter from Superintendent. Devicolam Division. No. 24 of 49 2510. 17/6/89.

Resolved that a copy be sent to the British Resident.

Resolved that the Honorary Secretary do write to the British Resident saying:—

"That in view of the tone of Debates at the last Sri Mullam Assembly and with reference to the enclosed letter the members of this Association will be glad if the British Resident will take note ot these remarks and also hope that the rights of British subjects holding land in Travancore, will be safeguarded.

Read letter from Mr. Leahy dated 31-3-14 *re.*, the Re-survey of Estates.

Resolved that the Hon. Secretary do write to the Dewan as follows:—"That with reference to the re-survey of Estates in this District this Association consider it unfair and unnecessary that estates having no dispute regarding boundaries and that have paid their Taxes regularly as demanded should be re-surveyed except at Government expense.

Read letter from Secretary U. P. A. S. I. dated 7th February, 1914.

Read letters from the Honorary Secretary, Kanan Devan Planters' Association of 8th February and 16th Febuary, 1914.

Read letters from the Chairman, Kanan Devan Planters' Association of 4th March, 1914. Read letter from Mr. McArthur dated 12th February, 1914.

Read letter from the Chief Secretary to Government No. 2424 of 11th March. Read letter from the Hon. Secretary, South Mysore Planters' Association dated 26th March.

Sri Mulam Delegate's Report.—"I attended the Sri Mullam Popular Assembly as your Delegate and as instructed brought up the two questions.

1. The grant of licenses for shooting big game under the Forest Regulations.

2. The Kodimutha Landing stage at Kottayam.

"I asked for a reduction of the license fee of Rs. 100/ for shooting big game over a period of 6 months; but Government said they did not consider the fee excessive and therefore could not make any reduction. Certain suggestions have gone before Government and these will ultimately go to the Superintendent, Devicolam, for report when we hope something will result.

I pointed out to Government the necessity of enlarging the present Kodimutha landing stage and left in their hands a plan showing what extension would be necessary; Government have the matter under consideration."

Mr. Roissier proposed a vote of thanks to Mr. Wilkie for his report and for having represented us at the Sri Mullam.—Carried with applause.

Bangalore Delegate's Report.—"Gentlemen,—Mr. Prince and I attended the Special General Meeting of the U. P. A. S. I. as your Delegates in connection with the proposed Labour Commission of Southern India.

The gathering was a very large one including Delegates from nearly every planting district in Southern India and the matter was very thoroughly gone into.

One of the first points raised was the construction of the Executive Committee. A circular issued just before the meeting was rather misleading and in the absence of explanations gave the impression that the Labour Commission was practically to be controlled by Messrs. James Finlay & Co. I need only say that the explanations given by Mr. Martin and other members of the Executive Committee thoroughly cleared up this false impression and the report and recommendations of the Executive Committee were unanimously adopted and the control of the Labour Department will be absolutely and solely in the hands of the U. P. A. S. I.

A series of 17 resolutions were then passed all of which you have no doubt read in the *Chronicle*.

There was a good deal of discussion on several points but in the absence of the printed copy of the proceedings which I had hoped would have reached us ere this, I am afraid I can tell you little more than has already been published in the papers.

As regards the handing over of the South Travancore Recruiting Agency in which we are mostly interested, certain stipulations were made at a meeting held at Ashley when Mr. Prince and I were elected to represent you.

The first was "That our Agent, Mr. Prince, should not be moved from his present headquarters."

The second was "that so far as we are concerned we should be allowed to work on the same lines as we are doing at present."

I had Mr. Martin's assurance that Mr. Prince would not be moved from Nagercoil and that there would be no change made in our present system of working through the Agency.

As regards the necessity of Labour Commission I don't know that I can add anything to what I have already said but after the discussions which took place at Bangalore I am more convinced than ever of the necessity of supporting the scheme.

I have also had some valuable information given me regarding the Straits from a Straits Planter who had many years experience in South India; and was well known in Travancore, and his ideas on the subject were that we would require to show a great deal more combination amongst ourselves than we do at present if we hope to hold our own with the competition that will be brought against us in the near future.

One piece of information I got will no doubt be a surprise to some of our neighbours in the Rubber Districts, and that was, there are several estates in the Straits almost entirely worked by Malayalam Labour, and yet the argument that the West Coast cooly would not emigrate was one of the chief points brought forward by one or two prominent rubber planters.

It only goes to prove that the history of other Districts which I have quoted both here and at Mundakayam on previous occasions will, and is repeating itself on the West Coast.

At present some 68,000 acres have been registered in favour of the Labour Commission and I only hope the balance required to bring the acreage up to the required total of 100,000 acres will be forthcoming before the 1st of July. If we fail to get this the scheme falls through and we will drift further into the mire and lay ourselves open to very serious accusations from our Directors and shareholders at home.

Scientific Officer.—This matter was also discussed at some length, a report of which appeared in the *Madras Mail* of the 13th March, but here again in the absence of the full proceedings of the Meeting I cannot tell you much more than you have already read in the papers

The chief point was that Government required another 1,000 to meet the expense of continuing Mr. Anstead's services for another period of five years, and it was agreed to provide this from the U. P. A. S. I. funds.

It was also proposed to ask Government's permission to provide the Scientific Officer with a Motor Car on the instalment system.

Mr. Anstead made a very strong point of having an experimental farm and a Mycologist both of which would add great value to the Scientific Department, but as the Hon. Mr. Barber said in his address, it was a question of funds and we certainly cannot ask local Associations to increase their subscriptions at present.

There was also a proposal to hand over the control and working of the Scientific Department to Government asking them to run an experimental

farm and provide a Mycologist, the U. P. A. S. I. paying so much yearly to the scheme.

This matter is referred to the local Associations for discussion and to be brought up at the next meeting of the U. P. A. in July, but until we have the full proceedings of the Bangalore Meeting before us I would prefer to leave further discussion on this matter over for the present.

I think this covers most of the points discussed at the meeting, but I will be very glad to answer any questions any one may wish to put to me.

Mr. Westaway proposed a vote to thanks to Mr. Richardson for his Report and for kindly representing us.—Carried with applause.

Resolution by Mr. Richardson.—"That Delegates from all Travancore, Cochin and West Coast Associations do meet once a year at some convenient place and date to discuss local affairs.

That a copy of this resolution be sent to all Associations concerned. That in view of the early date of the next U. P. A. S. I. Conference it would be advisable to hold this Meeting as soon as possible."

Seconded by Mr. T. C. Forbes and carried unanimously.

Ropeway Commission.—Mr. Bissett being now on leave Mr. T. C. Forbes was elected to replace him on this Committee.

Ropeway.—"Gentlemen,—We have now received two estimates for the proposed Ropeway and a third is on the way out from home. I am glad to say since Messrs. Sinclair's visit to Peermade the London people seem now quite convinced that the Ropeway will be the salvation of the district as far as transport is concerned. I think we may take it that the Ropeway scheme will go through and I may say that the Stagbrook and Southern India Companies are prepared to go to the length of £2 per acre if necessary, provided others will do the same.

I hope, however, that other Estates may still be induced to join in which case it would obviate such a heavy cess.

The three estimates vary considerably but as a full detailed estimate has only been secured from one firm it is impossible to compare them at present.

From the figures available it certainly looks as if the estimated charge of Rs.6-8 per ton would be ample to cover all charges and interest on capital.

The initial cost may be more than at first anticipated but it must be remembered that the Ropeway will add at least £10 an acre to the value of Peermade Estates and the outlay should be recovered in a few years.

I do not propose to go into further details at present but will be glad to show the Ropeway Committee the estimates I have and would propose a Committee meeting be held this afternoon for this purpose."

Mr. Ellis proposed a vote of thanks to the Chair which was carried with applause.

The meeting then terminated.

REGINALD P. ROISSIER.
Honorary Secretary.

COFFEE IN THE DUTCH EAST INDIES

Catch Crop with Rubber.

FERTILITY OF THE SOIL.

Java has beaten India in the sugar trade; the agricultural methods pursued by planters in the Dutch East Indies have resulted in the successful cultivation of the coffee plant, in which Ceylon, more by ill-luck than bad management, has distinctly failed. The progress of the latter industry in the Malay Archipelago, Sumatra and Java was recently described in a lecture delivered by Dr. Navarro, Commissioner of the Sao Paulo Government. The treatise has been translated by Mr. J. P. Wileman, who writes from Rio de Janeiro:—

SUMATRA AND JAVA.—At the outset Dr. Navarro reminded his audience that the Dutch Indies comprise an area of some 698,000 square miles, or three and-a-half times the size of France. In December, 1905, they counted 37,402,500 inhabitants, who, by virtue of national increase and imigration from China and France, should now be at least 40,000,000. "Of all the Archipelago," continued Dr. Navarro, the most interesting are the islands of Java and Sumatra, the first of which has a population of 32,000,000, distributed over an area not half of that of Sao Paulo. Sumatra is almost double as big—that is, double the size of Sao Paulo—with 455,600 square kilmetres, of which two-thirds are virgin soil. Borneo is divided between Holland and England. The Dutch portion measures about 675,000 square kilmetres, with 1,700,000 inhabitants.

BORNEO.—The investigations were limited to Sumatra and Java, the most important islands of the Malay Archipelago, from which competition with Brazil may be expected. Borneo is, of course, enormous and its soil far richer than any of the other islands, where, besides agriculture, considerable mining operations are being carried on with the aid of native labour. The island of Celebes is the most noted for its Coffee, and third as regards area, with 190,000 square kilmetres, being, like Java and Sumatra, traversed from end to end by a chain of mountains. On this island excellent coffee is produced, principally in the district of Menade, in the north. The area of the island of Java is entirely cultivated under a system of land tenure *sui generis*. There are no private owners, all the land belonging to the Dutch Government, with the exception of certain concessions effected at the time of the English occupation of the island. Direct donation corresponds to the Government and usufruct to foreigners. Leases are usually for 75 years, with the obligation of cultivating same until the eighth year, under pain of heavy fines. Rental rules about $10.000 per annum per cultivated alquiere and is made obligatory from the fifth year to prevent more land being taken up by farmers than they can personally cultivate. When coffee prices fell to their lowest Government relieved lessees of their rents and so enabled them to hold out. The distribution of the population is, however, very different from ours, as out of a total of 3.200,000 inhabitants, only 878,000 are to be found in towns, the rest being spread over the island at the rate of 256 per square kilometre, a density greater even than that of Belgium.

A COMPARISON.—Sumatra is more fertile than Java, and Borneo than either, but from this point of view none of the islands can compare with S. Paulo, from either the chemical or physical point of view. The soil in Java rules from 30 to 40 centimetres in depth, but what constitutes its chief advantage is the high and regular temperature throughout the year from

January to December, virtually without alteration of seasons. The rainfall there is very heavy, reaching on some plantations as much as 10 m. m. per annum and on others 4, 5 and 6. That the soil in Java is inferior to that of S. Paulo from the purely chemical point of view is shown by the fact that neither sugarcane nor Indian corn can be grown for more than two years in the same ground, whilst in S. Paulo they may be cultivated for dozens of years without fear of crop failure. The conclusion is that in S. Paulo the land supports cultivation for much longer periods. The production of sugar in Java is enormous and in some of the estates sugar is cultivated on the same land alternately each five years. As regards the area under coffee in Java and other Dutch Colonies, it is impossible to give exact figures."

AREA UNDER COFFEE.—In 1910, said Dr. Navarro, Cramer, the first authority on East Indian coffees, estimated the area of Government plantations under coffee in 1895 at about 50,000 alquieres (120,000 hectares) and private plantations at about the same figure, or a total of 100,000 alquieres, or 240,000 hectares, under coffee for the whole island. In 1912 the area of Government plantations had fallen to 42,000 hectares, no statistics being available for private plantations. Although the rental paid per "bouw" is identical, the dissimilarity between planting conditions on one farm and another prevent any accurate estimate of the area under private cultivation being arrived at, seeing for one reason, that the distance apart at which coffee trees are planted varies with each region and species. To add to the difficulties of estimates, coffee has been widely interplanted with rubber, cacao and even kapok. Not even Cramer, an indisputable authority, cares to risk a definite opinion, whilst believing the area under coffee cultivation in Java to be about 35,500 hectares. This he desired to be understood, is a mere supposition on his part, and must not be taken as an official estimate, but it is confirmed by Dr. Navarro's own estimate of 300,000,000 coffee trees, Government and private all told, distributed over an area of 68,677 alquieres. Malangue, which may be regarded as the S. Paulo of the Dutch East Indies, possesses 21,288 hectares planted solely with coffee and a total of 35,480 hectares with coffee *cum* rubber, cacao, etc.

RUBBER CULTIVATION.—In 1900 a French writer, Cobaton, stated that the area under cultivation in that island was 124,410 hectares, since increased by 50 per cent. This, however, is incorrect, because this increase of plantation was generally in substitution of Liberian or Arabian coffees by Robusta. The Robusta trees in different plantations, Dr. Navarro observed, were the fourth species planted consequently on the same ground, and the 40,000,000 or 50,000,000 Robusta trees said to be in existence represent, therefore, merely re-plantations of exhausted areas. In the Province of Deli in 1900 there were eighty-two plantations, interplanted with rubber. Since then the rubber has no doubt been much increased. But as coffee is there cultivated as a catch crop with rubber, and the latter is passing through a serious crisis, it is possible that the cultivation of coffee may also fall off or remain stationary, though some planters seem to have resolved to undertake cultivation of coffee separately. According to the latest statistics, Sao Paulo possesses 683,845,410 coffee trees, distributed over an area of 875,000 hectares, or 361,571 alquieres. In other words, the area under coffee in Sao Paulo is six times greater than in Java while the number of coffee trees planted is nearly double. This difference is explained by the distance apart at which the trees are respectively planted. In Sumatra the cultivated area should be about 25,000 to 28,000 hectares, or 10,330 to 11,570 alquieres, planted with a total of 50,000,000 to 60,000,000 coffee trees. It is very difficult to tell what the planted area may be in the

other islands, concluded Dr. Navarro, as there are no organised statistics. The natives only cultivate coffee when obliged, as they have no natural inclination for this kind of agriculture, and to deceive the inspectors comply with the letter of the law by planting merely a few seedlings, which are afterwards generally abandoned.

OTHER ESTIMATES.—In reply to inquiries by the "Cia Prado Chaves," the following report was received from one of the leading firms of Rotterdam, after five days allowed for investigations :—"We calculate number of coffee-bearing trees in Java at 87,000,000 of which 15,000,000 Arabian, 7,000,000 Liberian and 65,000,000 Robusta. For Sumatra we calculate the total at 10,000,000 to 15,000,000." This makes in all 97,000,000 to 102,000,000 trees for Java and Sumatra. In his lecture Dr. Navarro puts the number of trees at 300,000,000, a discrepancy so considerable as to lead the "Estado de S. Paulo" to the conclusion that either the Dutch brokers who supplied the information or Dr. Navarro have made some mistake.

Commenting on the figures, Mr. Paulo Prado draws the following conclusion :—"Either it is true, as Dr. Navarro asserts, that in Java 82,000,000 trees produced only 82,000 bags of coffee, or only about 4 arrobas per 1,000 trees in 1902, or Java planters must be completely ruined." The translator of the lecture points out that the actual yield under the system of Government *cum* native plantations in Java cannot be taken as a criterion of what can be done with practically unlimited capital by English and American planters in Sumatra, and says that this part of the East is, in fact, the danger point to which particular attention should be given and not so much the plantations of Java, already largely exhausted.—*Commerce.*

THE WORLD'S GOLD PRODUCTION.

Some interesting statistics of the world's gold production have recently been published by the New York *Engineering and Mining Journal.*

The following are the figures for the past three years :—

	1911.	1912.	1913 (Uncorrected.)
	£.	£.	£.
Transvaal	34,011,855	37,719,852	36,470,200
Rhodesia	2,597,200	2,633,246	2,835,920
West Africa	1,039,498	1,477,205	1,657,720
Madagascar	541,328	585,000	603,000
United States	19,378,000	18,690,300	17,660,204
Mexico	4,976,020	4,500,000	3,500,000
Canada	1,952,420	2,511,858	3,060,000
Central America... ...	679,800	726,500	789,000
Europe (including Siberia) ...	7,288 720	6,619,500	7,108,000
British India and East Indies..	3,156,120	3,408,032	3,400,000
Japan and China... ...	2,133,300	2,183,000	2,200,000
South America	2,084,360	2,485,000	2,595,000
Australasia	12,936,840	11,327,160	12,783,490
Total ...	91,875,461	94,866,653	92,662,534

In 1913 the figures for December have only been estimated, and it is possible that the total for the year was greater than is shown above.

During the past few years the world's gold production has increased considerably. In 1903 it only amounted to £65,895,089 ; in 1904 it was £69,817, 650 ; and by 1909 it had risen to £91,985,490. (*Export World and Commercial Intelligence.*)

TEA.

A French Review of Tea Manufacture.

(Processes In China and Japan.)

The author Dr. Neuville, in his work "La Technologie du The" lays particular stress on the historical side of the discovery of the enzyme of tea, or thease, which worked such a revolution in the ideas of practical planters in the matter of tea making. It is acceptable to our national vanity that he rules out Azo the Japanese chemist, to whom this advance is generally credited, and ascribes it to the English chemist, Kelway Bamber, who pursued his researches in Ceylon. He points out, however, that Nanninga of Java almost simultaneously lighted upon the same discovery, "but it was the first of these two authors who published the most detailed studies upon the subject." He quotes Kelway Bamber, who wrote as far back as 1893. "And my experiences tend to show that the changes occurring in the leaf, during the process called fermentation consist of oxydation and the fact that this change can be effected at least within an hour after the breaking up of the cells (effected by rolling) shows that it cannot be due to living micro-organisms." Nevertheless, it was seven years before Kelway Bamber was able to isolate the cause of this oxydation in the enzyme or thease, a soluble ferment; which he finally succeeded in doing in the year 1900 thus putting beyond doubt the fact of its important function in the manufacture of black tea, and also the necessity of the prompt application of heat either moist or dry to the leaf in the manufacture of green tea, the enzyme being promptly destroyed by heat rising above 160 degrees Fahr. It was not until 1901, again following upon Kelway Bamber but without knowing of his work, that Azo, the Japanese, made the same discovery thus independently confirming the work of the English authority. Dr. Neuville has brought his erudition to bear upon previous work on similar lines, which perhaps suggested the secret of fermentation or oxydation to the workers in tea. He says the first known of these oxydases was the "lacasse" of Gab. Bertrand, which is found in the latex of the lac tree (Rhus Succedanea) and transforms by oxydation. The uruschic acid contained in the latex, into oxyuruschic acid a 'black' substance which constitutes the lac of the orientals." This latex when contained in closed vessels remains of a pale colour, but when exposed to the air it is transformed. Deprived of its enzyme it cannot fix oxygen nor transform itself into lac.

Properties of the Enzyme.

Dr Neuville draws strong attention to certain important properties of the enzyme which have a direct bearing on tea manufacture and so deserve the earnest attention of practical tea makers. In the first place light exercises a powerful destructive influence upon the enzyme. This has long been empirically known even before Kelway Bamber's discovery, for even in the belief of the old fermentation theory it was the practice to keep fermenting houses dark. Further he points out that leaf gathered in the morning is richer in enzyme than that gathered later in the day which has in consequence been longer exposed to the light. There is a good reason for the many deliveries of leaf which is the rule on many tea estates. Again he shows that within a narrow limit the leaf should be as neutral as possible. A very slight excess of acid either destroys the enzyme or paralyses it and on the other hand though to a less extent the same is true of an excess of alkali. Dr. Neuville also contributes some very readable pages as to the researches of Dr. Mann and others who followed upon the above named authorities, but he rejects the theory more recently put forward by G. Wargel, a German

authority, in the *Chemiker Zeitung*, attributing the aroma of tea to the presence of special varieties of bacteria, which he points out is not novel, though an authority, Kozai, for a long time defended it. But says Dr. Neuville it does not seem that it is indispensable or even useful, since aseptic fermentation gives excellent results while appearing to exclude the possibility of the intervention of bacteria.

Chapters on Manufacture.

The chapters in this work dealing with actual manufacture are full and complete, and accurately describe the procedure in the ordinary factory, but as these processes even in Java are carried out by the familiar British-made machines, there is scarcely any novelty for the British reader. The machines described are all of the Jackson or Davidson type. In the Chapter on "Fermentation," however, there is a good deal drawn from Dutch sources and the work of Nanninga, Van Romburgh and Lohmann, which bears very intelligently upon the somewhat obscure points of the fermenting or oxydising process.

Far East Teas.

The latter part of the work is devoted to the manufacture of tea in China, Japan and Formosa. The information contained therein is interesting without, however, being of particular use to British readers.—*Indian Planters' Gazette.*

Ceylon.

The following statistics of the exports of rubber of domestic production from Ceylon during the month of December, and the year ended December, 1912 and 1913, have been extracted from official returns issued by the Ceylon Government:—

To	Dec. 1912. Lbs.	Dec. 1913. Lbs.	Jan.-Dec. 1912. Lbs.	Jan.-Dec. 1913. Lbs.
United Kingdom ...	1,038,769	1,589,720	8,195,768	14,047,708
United States ...	588,604	583,632	4,702,922	6,059,320
Other countries ...	210,020	885,129	1,949,045	5,260,000
Total exports of rubber of domestic production ...	1,837,393	3,058,481	14,847,735	25,367,028

—*The Board of Trade Journal.*

Commonwealth of Australia.

The Regulations laid down under section 54 of the Customs Act respecting the standards for tea have been somewhat amended, and are now as follows:—

Regulation 28.—Tea which does not comply with the following standard of strength and purity shall be deemed unfit for human use.

(1). The extract obtained by boiling the tea with 100 parts by weight of distilled water for one hour shall be not less than 30 per cent.

(2). The ash obtained by incinerating the tea in a porcelain crucible shall not be more than 8 per cent.

(3). The portion of the ash soluble in boiling distilled water, called the "soluble ash" shall not be less than 3 per cent.

The above percentages are to be calculated on the weight of the tea dried for 3 hours in a water bath with the water kept briskly boiling.

In cases where, as the result of the analysis, it appears that the tea is a prohibited import, the notice to the owner of the report of the Analysis shall be in prescribed form, - *Consular Reports.*

POTASH SALTS.

The world's supply of Potash Salts, so essential for many branches of manufacture and for agriculture, continues to be a German monopoly, controlled by a Syndicate, in which the German Government have secured, by a special statute, the chief voice. This has been done in order that the Government may take care of the national interests bound up with such an important industry.

As may be imagined, the monopoly of a commodity so essential should yield splendid results financially, and would do so, were it not for the numerous works that have been opend, and for the establishment of which immense capital has been raised. The different works have a total capacity of producing a supply of potash salts in excess of the demand, enormous as it now is, and unless the supply was controlled by people able to grasp the whole situation, the industry would be cut up by a ruinous competition and fall on very evil days.

Fortunately the people who manage the syndicate are animated by reasonable views and appreciate the fact that it is more important to develop the demand than to obtain high prices which would restrict consumption, so that manufacturers and farmers in this country can depend on getting regular supplies at moderate cost and can thus be encouraged to use larger quantities.

It may be remarked that the greatest consumption of potash salts per acre is in Holland, and then Germany, where very large quantities are required for the potato crop.

In this country the use of potash is increasing from year to year, and there is no doubt that agriculture would be stimulated if farmers generally employed larger quantities. For many years farmers have been employing nitrogenous and phosphatic fertilisers, forgetting that potash on light soils is equally necessary, and as a consequence such soils have been depleted of the naturally small stock of the salts. Now the failing supply has to be made good, otherwise the yield of the crops, as is the case on a good many farms, shows a falling off which will become more marked every year.

That the supply of potash salts should be limited to the enormous deposits in the German Empire is a curious geological circumstance, and, quite naturally, geologists in other parts of the world have been keenly prospecting to discover fresh deposits. These investigations have been carried on in the United States for years, but without result, and miners in Canada, which seems to contain deposits of nearly every mineral in the earth, have also been on the look-out, but without any better success.

Recently deposits are said to have been discovered in Spain. Investigations and borings are being made, and it is hoped the deposits will prove to be of sufficient importance to be worked with profit, because a little more competition in the trade would be useful, even although for the time there are no grounds for complaint against the management and arrangements of the German syndicate.

Consumption of Potash Salts in the United Kingdom.

With reference to the estimate given in our short article "Our Greedy Crops" in last week's issue of the quantity of Potash salts used in the United Kingdom, it is pointed out to us by the importers, Messrs. F. W. Berk and Co., that our estimate is too low, and that for last year the figure

should be "potash salts equal to 200,000 tons of kainit." It is satisfactory to hear that the use of potash is so rapidly extending, and the crops for which it is used, will benefit by the additional supplies.

Maintaining Soil Fertility.

Taking all experiments into consideration, said Professor McDowell, every soil is an individual soil and every farm is an individual problem, and it is impossible to lay down general rules which will apply equally to all cases, but there are some general conclusions that can be drawn from these results.

Two of the important conclusions that can be drawn and which we draw from these results are—the economic farm management requires, not the use of farmyard manure alone, because there is not sufficient of it not the use of commercial fertilisers, alone, but the use of home produced manures supplemented by commercial fertilisers so far as may be found profitable and, secondly, that commercial fertilisers may be used satisfactorily and with good financial results—it is necessary they should be used regularly and in a systematic manner in connection with a well ordered method of cropping, rather than in a haphazard manner.

Chemical Manure will not Replace Farmyard Manure.

Some theoretical scientists talk as if crops could be continually cultivated by the application of artificial manure alone, being apparently under the idea that all that is necessary to do so is to supply the plants with certain calculated quantities of nitrogen, phosphoric acid and potash in concentrated forms. It would be as reasonable to feed animals on capsules containing certain quantities of oil, albuminoids, and carbohydrates. Plants must have bulk foods, they must have humus in the soil. There are, says Professor Chester Smith, two principal ways of adding humus to the soil. First by ploughing under farmyard manure, and, second, by growing green crops and ploughing them under. It is apparent at once that if the greatest amount of humus possible is to be made from farmyard manure, it should be hauled to the fields without rotting and ploughed under, so that the rotting may take place in the soil itself. From this point of view, therefore, the manure should be hauled to the field as fast as made. It should be ploughed under, also, not to too great a depth, but far enough to ensure the continuous presence of moisture throughout the season.

The importance of humus in preventing the drying out of the soils cannot be too strongly impressed. Note that in sand little water remains after three day's exposure, while in the muck and sand mixed there remained twenty parts out of sixty-five. This indicates that where the humus is present in our clay loams they will withstand droughts. Commercial fertilisers will supply the plant food, but they do not directly supply humus. They may be used to aid in this matter if they are applied to crops to be ploughed under, fertilisers should therefore be used with farmyard manure, not to replace it.

The Food of Plants Summarised.

1. In its early life, a plant draws its nourishment from the seed, tuber, or other food storing organs from which it springs.

2. As soon as the young plant is equipped with roots and green leaves, it is in a position to forage for itself.

3. The raw material used by the plant in making its food are carbon-dioxide (derived from the air) and water, with certain substances therein dissolved, which are assimilated by the plant through the root-hairs and rise up in the leaves.

4. More than 95 per cent. of the weight of green plant is derived from the carbon dioxide and water.

5. The other 5 per cent. of food is derived from the soil.

6. But this small quantity is of the utmost importance.

7. It consists of nitrate, phosphates, potash, lime, magnesia, &c.

8. In order to be absorbed, all these substances must be present in an "available" form—that is, they must be soluble in the soil water.

9. Except in rare cases, the only essential food materials likely to be deficient in soils are nitrates and phosphates of potash and lime.

10. These deficiencies can be remedied by cultivation and manuring.—(*Mark Lane Express Agricultural Journal.*)

Parasitic Flowering Plants on Rubber Trees.

By F. T. Brooks.

During a recent visit to an estate in Negri Sembilan it was noticed that a considerable number of old Pará rubber trees were attacked by two kinds of parasitic flowering plants in a manner similar to that in which mistletoe attacks certain trees in Europe. These flowering plants possess green leaves but weaken the host by obtaining supplies of water and mineral salts from the branches to which they are attached by means of suckers. Several of the rubber trees carried many of these parasitic growths which were evidently doing considerable damage, the portions of the branches beyond the place of attachment of the parasite being killed in a number of cases.

The area which was most severely affected by these parasitic flowering plants consisted almost entirely of trees in poor condition. They had probably been over tapped some years ago and were badly burred. The foliage was thin and it was probably this circumstance which enabled these parasites to become established, for in a tree possessing a healthy and vigorous leaf canopy the light below the crown of the tree would probably be sufficiently reduced to prevent the development of these troublesome plants.

All branches bearing such growths should be cut out and efforts should be made by manuring to stimulate a more vigorous development of the rubber trees. The trees should be rested until a better leaf canopy has developed.

The two species of flowering plant which are causing this trouble have not yet been identified but it is hoped to do this shortly; meanwhile a more detailed investigation is proceeding.

Both of the parasites concerned have simple, entire leaves which are quite different from those of *Hevea brasiliensis*; the leaves of one of the parasites are long and narrow, about 2″ by ½″, the leaves of the other are about 3″ by 2″.

Both parasites spread along the branches of the rubber trees by means of creeping stems which drive suckers into the host at intervals. Owing to their distinctness the presence of these parasites on rubber trees can be easily determined.—*The Agricultural Bulletin of the F. M. S.*

NITRIFICATION.

In the Agricultural Press and in scientific papers touching on agriculture, one so often comes across "nitrification" as being a vital process in fertile soils, that one is inclined to ask—what then is this vital process?

It is the transformation in the soil of organic substances of a nitrogenous nature into nitrates, or in other words, it is Nature's process of converting into a condition assimilative as plant food, substances which are not primarily in that condition.

It is by means of this wonderful process that farmyard manure, animal, and vegetable refuse gradually change their character, or as is commonly said, "decompose" and become so valuable to plants.

But in order that this beneficial change may take place in the soil, certain conditions are indispensable.

The air must be able to come into contact with the substances. The soil must be aerated. This is done by good cultivation. "Good cultivation is equal to a manuring" according to an old saying, and the more compact or heavier the soil the more necessary is good cultivation to admit the air. Then the presence of Moisture is also essential. Nitrification cannot go on in soils absolutely dry, hence it is that in the rainless districts of South America, Peravian guano remained unchanged for centuries, preserved by the climatic dryness, to fertilise the crops of our moist lands.

The presence of a basic substance in the soil is also essential, such as lime, hence partly the value of liming and the advantages of applying a lime-supplying fertiliser, such as basic slag, to land rendered acid by organic matter, peaty land, &c.

Again, if land is waterlogged, the process of nitrification is stopped, because the oxygen in the air cannot penetrate the soil, hence the necessity of draining land of that character.

It is the part of the farmer to assist by proper measures this natural process of nitrification.

Forms of Nitrogen.

Nitrogen is the most expensive of the three essential fertilising elements. It exists in three different forms—organic nitrogen, ammonia, and nitrate.

Organic nitrogen exists in combination with other elements either as vegetable or animal matter. All materials containing organic nitrogen are valuable in proportion to their rapidity of decay, because change of form must take place before the nitrogen can serve as plant food. Organic nitrogen differs in availability not only according to the kind of material which supplies it, but according to the treatment it receives.

Nitrogen as ammonia usually exists in commercial manures in the form of sulphate of ammonia, and is more readily available than organic nitrogen. While nitrogen in the form of ammonia is extremely soluble in water, it is not readily removed from the soil by leaching, as it is held by the organic compounds of the soil.

Nitrogen as nitrate exists in commercial products chiefly as nitrate of soda. Nitrogen in this form is directly and immediately available, no further changes being necessary. It is completely soluble in water, and diffuses readily throughout the soil. It differs from the ammonia compounds in forming no insoluble compounds with soil constituents, and may be lost by leaching.

German Potash Industry.

During the past year the sales of potash in its different forms of kainit, sulphate and muriate of potash, amounted to a value of more than £9,500,000, a figure which gives one an idea of the magnitude of the industry. During the first half of the year the trade in the south-east of Europe was impeded by the disturbed condition of affairs in the Balkans, which injured the usual business with Austria, but during the second half of the year trade improved again, and a good business through the current year is anticipated.

Potash from the Sea.

The commercial extraction of the elusive nitrogen from the atmosphere is an accomplished fact, and we are now told that, according to the calculations of an architect, it will be possible to get supplies of potash from the sea. Nitrogen from the air, potash from the sea, sounds very attractive, but we fear the sea-potash idea is a fantastic one, incapable of being realised.

Not because there is no potash in the sea; there is plenty of it in minute quantities: but because the cost of obtaining it on a commercial scale may be said to be outside the range of a practical industry,

Analysis demonstrates that in 3,000 lb. of sea water there is 1 lb. of potash; thus in 750,000 gallons of sea water there is 1 ton of potash. The problem to be solved is how to get it.

We fear, it will be a long time before we can say to the Potash Syndicate: "Look here, if you do not reduce your prices, we shall get our supplies from the Sea-Water Potash-Company."

Why does Liming sometimes fail.

It may be taken as certain that the cultivation of crops on a wide class of soils will not lead to satisfactory results, unless measures are adopted by dressings of lime or marl to provide against a deficiency of lime in the soil. It must be remembered, as proved by experiments at Rothamsted, that there is an incessant wastage of lime from the soil through drainage and other causes, and unless this continual loss is made good, the fertility of the land must be diminished.

Lime is not only one of the indispensable constituents of plant nourishment, but it also acts affectively on the mechanical and chemical condition of the soil. It may be said to apply the leverage to other sources of fertility. This is generally recognised by every intelligent farmer, and accounts for the increasing demand for lime of good quality and for chemical manures containing a percentage of lime. It is difficult for a farmer to comprehend why occasionally a dressing of lime does not produce the satisfactory results anticipated from the operation.

It is a necessary factor for the successful application of lime that the conditions of the soil as regards water and warmth should be normal, or should be made so. On the water-logged, heavy land lime cannot act with full effect unless the land has been drained and opened up to atmospheric influences, and on dry sandy soils, especially in dry years, it has little power to act.

Another and equally essential factor for success in liming is the presence in the soil of a sufficiency of the other fertilising constituents. One-sided manuring is a fruitful source of disappointment. Lime helps to convert into an available form other plant foods which may be in the soil,

but if any other essential constituent is not sufficiently present, there will ensue a partial failure of the crop. It is a good old rule that the manure cart should follow or precede the lime cart. A good dressing of farmyard manure is the best way to get the best results from liming, because it is certain that if dressings of farmyard manure or plenty of artificials do not go with liming the land will be impoverished. Thus the old saying. "Lime makes rich fathers but poor sons."

Another reason for the occasional want of success in liming is the application of excessive quantities, especially on light soils. For such soil marl is more appropriate.

It may also be pointed out that lime, especially in large quantities, does not seem to suit some crops. It is said to increase the tendency to scab in potatoes, but this is due to excessive applications. Small dressings of lime have not been noticed to produce this effect, but have been entirely beneficial in the crop.

In general, it may be said, that according to the latest experience and observations, the best results are obtained from moderate dressings of lime repeated every three or five years, and not from one excessive application. —*Mark Lane Express Agricultural Journal.*

PROPOSED TARIFF CHANGES.

Commonwealth of Australia.

Proposed Uniform Standards for Food and Drugs.—The Board of Trade have received from H. M. Trade Commissioner in Australia copy of the Report of the Commonwealih and States of Australia Second Conference, which was issued at Melbourne on the 27th June, 1913, respecting the adoption of uniform standards for food drugs.

The Conference, at which the Commonwealth and all the State Governments were represented, unaimously passed, *inter alia*, the following Resolution:—

> "The Conference, regards the proposed standards and the regulations controlling labelling to be reasonable, workable, and satisfactory, from the point of view of the expressed requirements of traders and manufacturers in the Commonwealth and abroad, and at the same time to be sufficient safeguards of the public health; but the benefits of these standards cannot be enjoyed, nor the present serious disabilities removed or lessened, unless legal effect is given to the recommendations of the Conference, and unless there is uniform administration in every State by the central authority."

The Conference, therefore, re-affirmed the Resolution of the Conference of 1910 that—

> "Since the value of the Regulations prescribing fixed standards for food stuffs and drugs depends vitally on the uniform efficiency and disinterested administration of such Regulations, the Conference urges strongly that they be administered by the Officers of the Central Depatment of Public Health only."

It also affirmed the desirability of adopting a uniform system of registration of manufacturer's or importer's guarantee throughout the Commonwealth.

In proposing certain uniform standards and regulations for consideration, the Conference resolved that the regulations respecting the *labelling* of foods and drugs should not come into force until at least 12 months after their publication in the *Government Gazette*.

The Planters' Chronicle.

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Contents.

The Labour Barometer has risen to 82293'90 acres. Those who still waver should receive additional confidence in the above figures that the Establishment of a Labour Department has become of vital necessity to the Planting Community.

We print the Proceedings of West Coast Planters' General Meeting. We hope that the good example set by the one Estate, mentioned by the Honorary Secretary, as having joined the Labour Department will be followed by many others.

Like King Charles' Head in Mr. Dick's memorial, Labour and the Labour Department are continually cropping up, but we make no apology for reproducing and commending to the attention of all those who still doubt the remedy proposed the article on the South India Labour Troubles. Combined, the opinions of the two Collectors, are strong arguments in favour of the Labour Department, and as an expression of official opinion is worthy of consideration.

From the *Gardeners' Chronicle* we publish a valuable extract from Dr. Russell's lecture on the "Mutual Relationship of Soil and Plant."

The *Agricultural News* furnishes us with an article on Japanese practices in manuring and shows how extensively fertilisers are coming into use in Japan.

We publish from *Grenier's Rubber News* the reports of the leading firms rubber statistics for 1913.

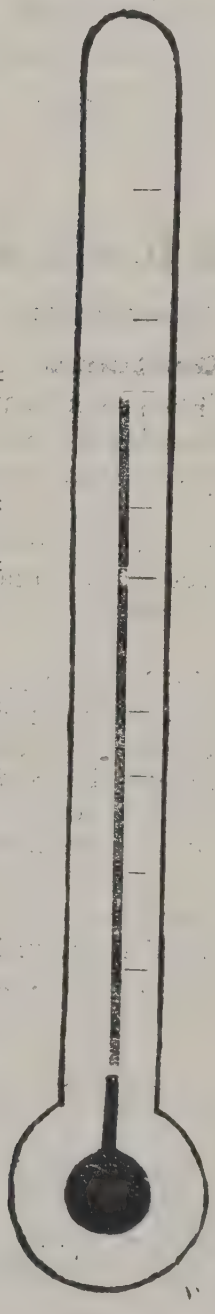
Others besides ourselves recognize the grave danger that the Indian Empire is running by the Emigration of her Agricultural labourers, countenanced as it is by the Government of India. The article deserves serious attention and we cannot but endorse emphatically the last two very convincing sentences.

We publish a letter from Mr. Mead, which we hope will bring an answer from some large Employer of labour, who has joined the Labour Department from reasons equally convincing as those given by Mr. Mead for abstaining at present. There is much in this letter, with which we do not agree, and we can hardly bring ourselves to believe that Mr. Mead has read very carefully the proceedings of the Extraordinary General Meeting or he would not have put one or two matters in quite the same way as he has.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

West Coast Planters' Association

Proceedings of a General Meeting held at the Cochin Club, Cochin on 19th April, 1911.

PRESENT. Kerala Rubber Co. per R. Lescher, Periya Rubber Co. per J. Martin, Malayalam R. and P. Co. per A. C. Morrell, Mooply Valley R. Co. per E. H. Hallilay, Eddivanna R. and T. Co. per Proxy, Cochin Sholayar C. R. Co. per Proxy, Cochin Rubber Co. per Proxy, Thodupuzha Rubber Co. per proxy, Pullengode Rubber Estate, Ltd., per H. Waddington (Honorary Secretary). *Visitors.*—Messrs. R. T. Bowels, H. H. Jones, C. H. Lane, and C. L. McLean. Mr. A. C. Morrell in the chair.

The Proceedings of last meeting and the Chairman's and Honorary Secretary's Reports as dealt with in Committee at Calicut and published under date 4th February last were taken as read and confirmed.

183. *New Members.*—Mr. H. A. Beachcroft as a subscribing Member and Mr. E. L. Mahon as an Hon. Member were elected.

184. *Honorary Secretary's Report.*—The Honorary Secretary made the following report which he was asked to have printed in Proceedings of the Meeting.

"The Annual General Meeting was called for 4th February, but had to be adjourned for want of a quorum. A Committee Meeting was held that day, which enabled me to print and circulate to members the Proceedings, so that they should know what was going on, but we were unable to pass accounts or elect Office Bearers for the year. Our Chairman is on his way home and so regrets he is unable to be present to-day.

185. The Cochin Sholayar Chemoon Co. have joined the Association since last meeting and two members have been elected to-day. The acreage now represented by the Association is 13,173 acres and there are twelve private members.

186. The two Estates which offered support to the International Rubber Exhibition withdrew on learning no others would join them and I understand Southern India is not being separately represented through any of the Planters' Associations.

187. From the Proceedings of the Extraordinary Meeting of U.P.A.S.I. held at Bangalore to consider the starting of the proposed Labour Department you will have seen we did not send a Delegate. Mr. Mead was unable to go and the Chairman and myself were neither able to spare the time. As no estate belonging to this Association then promised support it did not seem to us very important to be represented. Since that meeting, I am glad to report one estate in our District has joined and I hope it is the first of many to do so.

188. Accounts for last year, duly audited are on the Table and I trust you will pass them. A Memo. of Association's Accounts to date is also on the Table for your information. I regret my call for this year's subscriptions has been very poorly responded to, only four estates have so far sent in their subscriptions and I would ask those in arrears to now remit what is due, to enable the Honorary Secretary to meet subscriptions owing. In

accordance with sanction passed last year I have transferred the Association Banking Account from Calicut to Madras.

189. Subscriptions to the S. I. P. B. Fund are coming in well and Rs.140 has been collected and remitted to Bangalore.

190. I wrote the Mundakayam P. A., in accordance with Resolution of Committee Meeting held in February, suggesting a Committee draw up a scheme for a Rubber Growers' Association in Southern India but have heard nothing further to date.

H. WADDINGTON,
Hony. Secretary.

191. *Finance.*—The Accounts for 1913 were passed and a vote of thanks to Mr. A. H. Robb for auditing them carried.

Resolved that the Central Malabar Syndicate be asked to settle arrears of subscriptions due for 1913.

192. *Rules.*—Proposed by Mr. H. Waddington and second by Mr. Jasper Martin.

That Rule XIII now reading:—

"Each Estate and Member being entitled to one vote for each ten "rupees subscribed"

should be amended by changing words

"for each ten rupees" to "for each rupee."

Amendment proposed by Mr. E. H. Hallilev

"That Rule XIII stands as it is."

The amendment, meeting with no seconder, was withdrawn and the original Resolution carried unanimously.

The Honorary Secretary was instructed to have the Rule as amended, together with a complete list of all members of the Association and affiliated Branches printed and circulated.

193. *Lady Ampthill Nurses' Institute.*—Read letter from Central Travancore Planters' Association advocating united action to obtain admission of Hon'ble Mr. E. F. Barber as a member of the management Committee. The feeling of the Meeting was not in favour of the proposal.

194. *U. P. A. Labour Department.*—Read letter from Mr. R. H. Morris to South Mysore P. A. with reference to preferential treatment of Coffee Estates regarding subscriptions, on the grounds that it is generally admitted Rubber Estates employ two coolies per acre to one on Coffee Estates.

In the opinion of the Rubber Planters present, rubber does not and never will require as much as ¾ cooly per acre at the outside.

195. *Date of U. P. A. S. I. Meeting.*—Read Circular No. 8/14 suggesting 6th July to which the meeting agreed.

196. *Next Meeting W. C. P. A.*—Proposed by Mr. E. H. Hallilev and seconded by Mr. J. Martin. "That the next Meeting of this Association be held at Calicut on Friday 5th June to elect and instruct Delegates for the U. P. A. S. I. Meeting at Bangalore."—Carried unanimously.

167. *Office Bearers*, 1914.—The following were elected :—

Mr. A. H. Mead	...	...	Chairman.
Mr. J. Martin	...	...	Committee.
Mr. A. C. Morrell	...	...	,,
Mr. R. Lescher	...	...	,,
Mr. H. Waddington	...	...	Honorary Secretary.

198. *Branch Associations.*—The Meeting considered and resolved that all Honorary Secretaries of affiliated Branch Associations should have the right of attending and addressing all General Meetings.

Votes of thanks to the Chair and to the members of the Cochin Club for use of this meeting terminated the Proceedings.

Papers on the Table.—Proceedings of the Cochin Planters' Association Meeting 25th January.

A. C. MORRELL,
Chairman.

H. WADDINGTON,
Honorary Secretary.

"COMPLETE" MANURES GIVE SUREST RESULTS.

Complete manures, that is fertilisers containing nitrogen, phosphates and potash can be depended on, says an expert, to produce, on an average, the surest results.

Chemical analysis has shown soils, as a general rule, to contain relatively less nitrogen and phosphoric acid than potash. It has also shown that light and peaty soils are invariably deficient in potash, and that heavy clay soils contain an abundance of potash, but that potash only becomes slowly available for the use of crops, especially in the earlier stages of growth. This abundance of potash has been interpreted to mean that for soils of the latter class potash is an unnecessary ingredient in the manures that are to be applied. But chemical analysis of soils is of itself a far from safe guide in the selection of manures suitable for such soils. The carrying out of field experiments with different combinations of manures is an infinitely more reliable and satisfactory method of asking the soil what manures it requires. And as a result of such experiments conducted throughout the whole country, on every kind of soil and with all ordinary crops, an answer has been received in no indefinite terms, which should convince us, once for all, of the inadvisability of relying solely on chemical analysis as our guide. That answer clearly indicates that on heavy and light soils alike it it is the complete manure which gives the most beneficial and profitable returns—*i.e.*, a manure which contains suitable proportions of ammonia, phosphoric acid, and potash. That has been the invariable experience, not only of public bodies engaged in agricultural reasearch work, but of private individuals also. It may, indeed, be safely asserted that no intelligent farmer who has derived from them will every discontinue their use. There is no surer way of a man becoming convinced of the efficacy of potash manures than by experimenting for himself.—*Mark Lane Express Agricultural Journal.*

SOUTH INDIAN LABOUR TROUBLE.

Ceylon and the Madras Planters' Labour Act.

The reports of the working of the Madras Planters' Labour Act for the past year, by the Collectors of the Nilgiris and Malabar, the only two districts where it is in force, show that the prosecutions under the Act are steadily growing. In the Nilgiris they have risen from 1,095 to 1,654 and in the Wynaad to 1,453 from 1,047. The rapidity which these increases occur is shown in North Wynaad where they have risen from none in 1909 to 215 in the present year under review. The great majority of these cases are between maistries (Kanganies) and coolies, and in the Nilgiris only 25 were instituted by the planters themselves. Two different views on this matter are offered by the Collectors concerned. The Collector for the Nilgiris, for instance, states that the large number of desertions amongst coolies is due to misunderstandings among maistries and coolies, who, since neither are educated, get their accounts muddled. The maistries over estimate in their own favour the amount of the balance of the advance still due to them, while the coolies are naturally apt to go to the other extreme. The consequence is that the coolies have little faith in the maistries and abscond the moment the opportunity offers. Mr. Innes, the Collector of Malabar, however, has a different opinion to offer and one which in the opinion of the Madras press has a juster appreciation of the causes at the bottom of these troubles. It is said that he has been assured by planters themselves that they have never before experienced such difficulty in getting labour, and he is disposed to agree that the causes at work are not only the unregulated internal competition but also the very strenuous competition of Ceylon and the Federated Malay States. He hopes that the proposed Labour Department will become an established fact as he believes it will be not only an engine for improving the labour supply, but also for regulating it in such a way that less recourse will be made to the penal sections of the Planters' Labour Act, for the increasing use is said to be becoming embarassing. Mr. Innes remarks: "At any rate, if the Commission is properly worked, it ought to reduce the number of swindlers, who - both as maistries and labourers—receive advances under fictitious names and false addresses, and it should also check the growing tendency to make excessive advances to maistries, who, even when honest, are tempted by the sight of large sums of money to undertake to furnish more labour than they can possibly recruit." The numerous prosecutions under the Act, says the Collector of Malabar, are not in any way connected with harshness or indifference on the part of the planters in the treatment of their coolies. The coolies are well paid and well treated. They are housed in *pukka*-built lines and get bonuses for extra work. Their wages are so high that many of them are content to work only five days a week. Other material advantages held out are medical schemes, dispensaries, schools, homes for nursing mothers, etc. A comprehensive anti-malaria scheme has begun with work in clearing and draining swamps, and indeed it is said that Government themselves could hardly do more—and frequently do less—than the Planters whose difficulties are referred to.—*Indian Planters' Gazette.*

Coffee.

The imports of coffee were £25,949 greater in value than in 1910 and £6,458 greater than in 1909. The great bulk of the coffee imported was Brazilian; and the Baghdad prices were high (£3 15*s.* to £5 per cwt.), owing to higher cost in the country of production and to the competition of consumers elsewhere.—*Diplomatic and Consular Reports.* Turkey. *Report for the year* 1911 *on the Trade of Baghdad.*

SOIL

Relationship of Soil and Plant.

At a recent meeting of the Royal Dublin Society, Dr. Russell, Director of the Rothamsted Experimental Station, delivered a lecture on "Mutual Relationship of Soil and the Plant."

Having expressed the thanks of the Committee of the Rothamsted Station to the Royal Dublin Society for the support given to the movement, for erecting a laboratory to commemorate the centenary of the birth of Lawes and Gilbert, the lecturer said the fact had been long ago established by practical farmers that certain crops and plants showed marked preferences for certain types of soil, and would not do as well on other types of soil, no matter what care or skill was used. How was it, he asked, that the close connection between the soil and the plant arose? The answer was that each plant required certain conditions - water, air for the roots, food, etc., and where it found those conditions it grew well. Those were very largely soil conditions, but not entirely; climatic factors cut across the soil factors, and prevented too rigid a classification of flora according to soil types. But closer examination showed there certainly was a specific soil type effect, the study of which was of great practical importance. Investigation had shown that the plant had almost as marked an effect on the soil as the soil had on the plant. Right from the outset the soil had been affected by the vegetation growing on it. The mineral matter that formed the main part of the soil split off from rocks in consequence of various physical and other agencies, and after many wanderings came finally to form the surface of the present soil. But it did not remain bare. It soon covered itself with vegetation. Plants grew, took out from the soil moisture the mineral and nitrogenous food they wanted, built up carbo-hydrate material from the gases of the atmosphere and the rain water. There were two highly important effects produced—(1) organic matter was added entirely different in character from the matter already there, and impressing a new lot of properties on the soil; (2) the organic matter contained stores of energy derived from the sunlight; when it mingled with the soil and began to decay the energy was set free and enabled micro-organisms to live in the soil. It took out certain constituents which if not replaced would lead to exhaustion. Recent experiments suggested that that remarkable effect was only produced when soil bacteria were present. It appeared, therefore, that between them the plant roots, the soil and the bacteria might set up something in the soil that was poisonous to plants. The possibility that a plant might thus foul the soil and injure it for another plant had long been part of the tradition of the gardener and farmer. During the last year or so a new way had been discovered in which the plant affected the soil. It had been shown that the growing plant somehow interfered with the activity of bacteria that made plant food in the soil, so that less plant food was made on cropped land than on land lying fallow. Modern research showed that the soil was not a mere mass of inert minerals, but a wonderful structure honeycombed with recesses and inhabited by teeming populations, micro-organisms, which science was just beginning to explore. The plant sent its roots into this living mass, and in some way not yet comprehended those roots interfered with the normal life of the organisms, and so effects were produced that one did not get in soil bare of all vegetation. The difficulty of finding out what really was going on was increased by the fact that they could not see into the soil. No microscope existed that would peer into its recesses; they could only gain knowledge by indirect means. But it was imperative that the man of science should go on with exploration. —*The Gardeners' Chronicle.*

MANURES AND MANURING.

Japanese Practices.

The following is an abstract of one of a series of articles on Japanese agriculture, taken from the *Experimental Station Record*:—

It is shown that the use of commercial fertilisers in Japan is of comparatively recent date, but is rapidly assuming large proportions. This estimated total value of fertilizers now used is from $34,860,000 to $39,840,000 annually. The use of commercial fertilizers in supplementing, and to a considerable extent, superseding the older practices depending upon the use of night-soil, straw-ashes and similar fertilising materials. The use of animal manures has played a comparatively insignificant part in Japanese agriculture because the number of animals is small and the manure is usually poor in fertilizing constituents. Green manuring, especially with green grass, *Astragalus sinensis* and *Medicago denticulata*, is practised to some extent. Japanese soils are not naturally very fertile and the system of continuous cropping which prevails is very exhausting to the land, hence the free use of fertilizers has been followed with very profitable results.

The imports of fertilizing materials into Japan are large and include all of the usual fertilizing materials, mixed and unmixed, besides a variety of oil cakes and miscellaneous materials. German Potash Salts have only been recently introduced and their use is still limited chiefly to a small amount of sulphate of potash. The home-produced fertilizers include various kinds of oil cakes and fish manures, bone, hoofs, horn, hair, rice bran, by-products from the soy, the sake, the beer, and other industries, wastes from silk-worm rearing and cocoons, a little sulphate of ammonia from gas works, a small amount of calcium cyanamide, besides superphosphates and mixed fertilizers of different kinds. The principal centres of fertilizer manufactures are Tokio and Osaka.

The Osaka fertilizers were originally made largely for use in aquatic agriculture (rice and rushes) and were compounded chiefly of ammonium sulphate and superphosphate, a mixture which seems best suited to soils in which the transformation of nitrogen does not, as a rule, go beyond the ammonia stage and which does not have the same ultimate acid effect as would the same combination of manures applied to dry land crops. . . Partly from geological reasons and partly from manuring practices long continued, most soils in Japan have a tendency to become acid and this is more marked . . . in the case of non-irrigated fields . . . In the manuring of rice, Japan is very far in advance of any other rice-growing country, in the manuring of mulberry Japan has no equal, in the manuring of tea she is behind Ceylon and in advance of China, and in the manuring of sugar-cane considerably behind Hawaii and in advance of the Phillippines. Only within recent years has the manuring of the winter cereals, barley and wheat, received serious attention.—*The Agricultural News.*

Sisal (Agave rigida var. Sisalana) will not thrive without a certain proportion of lime in the soil. It is very easy to ascertain whether this is present or not, by taking a portion of the soil and pouring some hydrochloric acid in it. If lime is present, an effervescence will follow. Should this not occur, it will be necessary to apply lime before planting. About one ton per acre would be sufficient. The above test will not tell you what quantity of lime is in the soil; it merely shows that it is there.—*Queensland Agricultural Journal.*

RUBBER.

Some Figures Relating to Rubber Production.

The leading firms of Rubber brokers hrve now issued their market reports for 1913, and some interesting statistics are available as to Rubber Production.

PLANTATION RUBBER.

The following table shows the qualities of Plantation Rubber offered at the London Auction Sales for the last eight years:—

Year.	Ceylon.	Malaya.	Total.
	Tons.	Tons.	Tons.
1906 ...	98¼	250¼	348½
1907 ...	192½	621½	814
1908 ...	290	1,005⅓	1,295½
1909 ...	432	2,252	2,684
1910 ...	761¼	4,432¼	5,193½
1911 ...	1,622	8,077	9,699
1912 ...	3,150	14,507	17,657
1913 ...	4,464	17,948	22,412

This shows the wonderful growth of the rubber market in London. The following figures from the Circular of Messrs. Figgs & Co., also will illustrate the same point. The figures include all descriptions of rubber.

LONDON.

Year.	Imports.	Deliveries.	Stock on 31st Dec.
	Tons.	Tons.	Tons.
1909 ...	5,433	5,207	604
1910 ...	9,235	8,392	1,447
1911 ...	13,368	13,001	1,814
1912 ...	24,014	23,064	2,764
1913 ...	34,913	33,575	4,102

It will be seen that the stock on hand on 31st December last was not excessively large having regard to the greater volume of imports. The comparison of the following table with the above will show how London has become the great commercial trading and distributing centre in the rubber trade.

ENGLAND.

Year.	Imports.	Deliveries.	Stock on 31st Dec.
	Tons.	Tons.	Tons.
1909 ...	24,563	24,225	1,848
1910 ...	32,659	29,980	5,231
1911 ...	33,964	34,054	3,954
1912 ...	43,853	44,238	3,569
1913 ...	55,270	52,854	3,985

In 1909 imports were only 5,433 tons out of a total of 24,563 tons. In 1912 London imports were not less than 34,913 tons out of 55,270 tons. Thus London's proportion of the import trade has risen from 22% to 60%.

PLANTATION RUBBER SHIPMENTS FOR 1913.

These are given by Messrs. Figgs & Co., as follows :—

January ...	3,093	600
February ...	2,783	859
March ...	2,857	1,082
April ...	2,482	755
May ...	2,431	684
June ...	2,339	598
July ...	3,031	993
August ...	3,635	1,199
September ...	3,072	1,112
October ...	3,353	1,064
November ...	3,133	1,495
December ...	3,200	1,150
Total...	35,409	11,591

The figures are interesting as indicating how the difference in climatic conditions affects the outputs in the Malaya Peninsula and Ceylon. The great variation in the Ceylon figures arise of course from wintering and the seasonal changes peculiar to the Island.

SOME WILD RUBBER FIGURES.

	1909. Tons.	1910. Tons.	1911. Tons.	1912. Tons.	1913. Tons.
Brazil ...	42,000	40,500	39,500	40,500	39,000
W. Coast Africa including ...	15,500	14,800	15,000	13,800	10,000
Benguela and Mossamedes ...	1,920	1,600	1,900	1,800	1,300
Loanda ...	950	800	430	420	400
Congo, French Congo & Loudan..	6,300	6,000	6,200	6,000	4,400

The falling off will be noticed from all the West African centres, and the decline will be much more marked during the current year.

Messrs. Gow, Wilson and Stanton's figures showing the movements of all kinds of rubber in the United Kingdom for 1913 also illustrate the falling off in the supplies from the wild rubber centres.

	Month December.		
	1912. Tons.	1913. Tons.	Decrease. Tons.
French West Africa ...	133	43	90
Peru	303	194	109
Brazil	1,535	1,369	166
Gold Coast	92	14	68
Other Countries ...	1,678	1,371	307

	Year.		
	1912 Tons.	1913 Tons.	Decrease. Tons.
French West Africa ...	1,507	1009	498
Peru	1,605	1,301	304
Brazil	15,174	11,768	3,406
Gold Coast	784	672	112
Other countries	14,865	19,391	4,426

The decline in prices is now beginning to seriously affect shipments, and statistics for the early months of 1914 will bring out the decline in still stronger relief.—*Grenier's Rubber News.*

IMMIGRANTS.

Indian Immigrants to British Colonies.

It is a strange anomaly that whilst India herself is shorthanded for labourers for her own Industries, on which depends her welfare and her advancement, we have an altruistic Government bent on fostering emigration to British Colonies of some of the very class of its subjects which are so much needed here. The marked attention of the Government has been drawn to the subject time and again, but all efforts to have a stop put to emigration have so far proved futile. The specious arguments put forward by the Government in defence of its policy, although refuted, still holds the bureaucratic mind, and it is to be feared will hold it, until, it may be, the mischief done has gone too far to be remedied. The Immigration Department reports of the British Colonies annually send forth most glowing accounts of the prosperity of those who have crossed the *kala pani* in search of that wealth, which it is *assumed* they could not possibly have amassed had they elected to seek fields and pastures new in this their own native land. Of the very large numbers who have emigrated, some few sturdy souls have undoubtedly done well, have prospered and have bettered their position and prospects. But it cannot by any means be directly inferred from this that these same individuals, hard working and thrifty labourers, would not have done just as well, if not better, had they betaken themselves to some of the Tea districts in Assam or Bengal. That the labourer is, all things considered, far better off in all respects, in the above named Tea districts, than in the Colonies, is a bold assertion to make, but the assumption could doubtless be verified, if some student of statistics had the leisure to collect the information necessary to prove the fact—a troublesome and expensive job at the best, as reports are so glossed over that they only show one the bright side of the shield and there is no getting at the back, except to a very limited degree, which serves no purpose. It is an open secret that the Government of India favours emigration rather than imigration, and it is this policy the Indian Tea Association and other bodies have been so strenuously fighting against. The policy of the Madras Government in closing recruitment of labourers from its Agency Tracts to Assam while encouraging recruitment to Crown Colonies is one which no Britisher in this country can understand. It appears to be one which, in the long run, will defeat its own ends. But there are hopes, that this long vexed question will soon be brought to a happy settlement. India is now in urgent need of all its own labouring classes and for the Government to encourage and permit them to leave its shores is a mistake which it will find to its cost later on. Who is to replace these indigenous toilers of the soil. Aliens from other countries? A very good suggestion has been put forward —a real boon to the Government, which will save it endless expense and trouble—ship all incorrigible long-term Jail birds to the Colonies as labourers. Let the Colonies look after and discipline them. They know how to deal with *badmashes*. The Andaman Islands Colony could be dispensed with, and a murderer under a life sentence, would not come back after seventeen years with Rs 1,000 odd to his credit as wages to start life anew, because he was fortunate enough to serve as a table servant to one of the officials. However, after this suggestion, which to say the least of it is a very fatuous one, and by no means complimentary nor agreeable to the Colonies concerned, as they do not want the undesirables of our populations, why should they not turn their attention to other countries, such as China and Java for the labour they require. The reason for the Indians being preferred to all others is undoubtedly that they are more docile and amenable to discipline, whereas

John Chinaman or a Javanese—as a labourer—is a hard nut to crack and successfully deal with. As an artisan he is a most excellent workman and it is probable that if properly handled he might prove a valuable agriculturist. But his ways are peculiar and the western mind has not yet fathomed him nor worked in unison with him in the field. The result is that he is not so much sought after as the milder Indian, who can be brought under on easier terms, albeit the worm turns sometimes. The broad fact remains that India is being exploited for labourers to a degree most dangerous to its best interests. The competition to obtain Indian labourers is becoming keener and keener every year. Organisations for this end are being perfected on all sides, and what will be the *dénouement* ? A *débâcle* such as the Imperial Government will have to take into serious consideration. The present system of recruiting for the Crown Colonies is inflicting serious damage to this country itself. Indian labour should be for India, which is sadly in need of it, and not for our Colonies which may well be left to look after themselves and draw their sources of supply without poaching on our reserves. India, all things considered, has not an overplus of the class of agriculturists it requires, nor of the class miners, mechanical and industrial workers, etc., who can be trained to effect good work for the benefit of their own country, instead of emigrating to foreign lands. Will India eventually be denuded of the best class of labourers she herself so sadly needs? On all sides there is a cry for labour, more labour, some industries are hampered on account of it, yet emigration to the Colonies goes merrily on and is fostered by a Government which pays no heed to reiterated warnings. But a day of reckoning will most assuredly come, when there happens to be a most serious set back to agricultural and industrial pursuits in this country, and the Government will be faced with as serious a problem as it has ever been compelled to deal with. There is no gainsaying the fact that India is gradually being denuded of the best class of its labourers and trouble will inevitably ensue, for the country must have labour for its own needs. Why then should not time be taken by the forelock and the situation be mitigated by a stop being put to emigration for a series of years until the matter has been thoroughly investigated and gauged. The Colonies want Indians, and want them badly, but only as labourers, not as free citizens, and it is just here comes the rub, and it is on this point that a struggle is being waged. The "liberty of the subjects" is considered here, but not so in the Colonies where all kinds of disabilities are enacted to hinder Indians rising to an equality with their white skinned brethren. They are on no account permitted to be the latter's rival in trade or business, however capable or efficient they may be, their place is always a back seat. Enough has been said to show that "all is not gold that glitters" and if the simple indentured cooly when he left these shores knew exactly the fate in store for him he would probably elect to stay in the land of his birth rather than migrate to regions beyond his ken, however luring the prospects of fortune placed before him: especially if he only knew that he could, and would, do just as well, if not better, by serving in India itself, where fortune and independence await him, if he will only take advantage of the fact. If there was really a surplus of labour in India, the Colony might well indent on it for their needs, but, as is well known, the shortage in this country is now so great that it can ill afford to see the drain on its own resources which is now going on. All hands should join and a vigorous campaign be undertaken to put a stop to the Emigration in vogue. It is not only Industries which are feeling the strain, but landholders also, and if they united in one common bond, some success might possibly be achieved.—*Indian Planters' Gazette.*

CORRESPONDENCE.

"White Lodge,"
Coonoor,
April 26th, 1914.

The Pros. & Cons. of the Labour Commission.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—Since I have been up in the Hills I have had the advantage of discussing the Labour Commission with the Hon'ble Mr. E. F. Barber as well as with certain other planters from Mundakayam, Wynaad, Mysore and Malabar and at Mr. Barber's request I once more ask for the hospitality of your columns.

I agree with Mr. Barber that labour is generally more out of hand than it used to be and that foregin competition will annually tend to become keener. Of course, this is more noticeable in some districts and some estates than in others, but the Commission would certainly do good generally in improving the discipline among both Kanganies and coolies. In any case it should prove efficient in dealing with the professional swindler, who deliberately takes advances from two or more Estates.

My main objection is the cost and though as Mr. Barber points out an increase of 10/- an acre to one's capital cost is not great and 2/- per acre off one's profits not likely to effect the dividends; still looked at from another standpoint one is loathe to pledge oneself to an expenditure of nearly £3,000 for what one personally is not likely to reap any material advantage from.

I think, however, that nothing could be more serious than the Commission going through without everyone thoroughly realising its scope and limitations. Certain points appear to me to have not been fully discussed and I took the opportunity of talking over them with Mr. Barber.

Reservation of Recruiting Areas for certain District.—I told Mr. Barber that I thought his speech at the Nilgiri meeting in which he said that South Canara would be reserved in future for Mysore and Coorg was at least unfortunate—I own at the time the idea seemed too impossible to receive credence, but that it did so is patent by Mr. Lake bringing the matter up at the Extraordinary meeting. It is a great pity that even at this meeting the matter was not put plainly. Mr. Martin's ignorance of what Preferential treatment meant struck me and others as more refreshing than candid. However I am glad to find that Mr. Barber agrees with me that there can be No RESTRICTION and that any district may recruit anywhere and that any estate subscribing is at liberty to ask help from the Commission in recruiting any class of cooly it wants to.

Personally I go further and feel sure that the one result that can be safely anticipated from the Commission is that there will be much increased recruiting in S. Canara for the tea estates in Travancore. A reference to a recent Planters' Association Meeting in Central Travancore shows the district to be already suffering from a shortage of men, and as tea estates are annually being better cultivated and manuring becomes a regular part of the programme this shortage will become more and more accute.

I personally know of no class of labour that would suit tea better than the S. Canara coolies. They bring a large proportion of men to the Estates, are good coolies and when once they learn that their womenfolk can earn very high wages as pluckers (with the introduction of manuring they will earn still more than is at present possible) it is only natural that the emigration will be greatly stimulated.

In talking to the Manager of a fine group in Wynaad. I was told that last year the S. Canara coolies had saved the situation and naturally this gentleman is keen on increasing his connection. Three years ago I doubt if there was a single S. Canara cooly working in the district.

Take one district as a second example. 3 years ago we did not employ a cooly from S. Canara. This year we shall employ a thousand in Cochin State alone.

Any tea planter belonging to the Commission is at perfect liberty to request the Commission to publish broadcast through S. Canara the prospects the cooly can look forward to in tea and if the K. D. H. P. Coy. find it a good advertisement to publish photographs of tea pluckers with the wages they have actually earned, I see no reason why similar photographs should not be distributed through the length and breadth of S. Canara.

The Coffee planter is quite needlessly scared of rubber as a competitor. The number of coolies we employ is less per acre than any product that I know of except Cardamoms. As we thin out our trees to 100 or so to the acre and as tappers get trained to do the same tasks as they are doing in Ceylon and the F. M. S. our numbers will be still more reduced. But Tea is likely to be a very serious competitior and the Commission cannot fail, as far as I can see, to precipitate matters. Is this the reason that Mysore and Coorg planters favour the Commission ?

Position of Non-Subscribing Estates.—This is naturally a more complex question and Mr. Barber and I discussed it at length. I quite agree a non-subscribing estate can expect no help from the Commission, on the other hand I cannot see how the Commission can actively oppose them. Mr. Barber says that the Commission will certainly not try and advance coolies already under advance to a non-subscribing estate but might try and persuade maistries to refuse a new advance. This tampering (I can use no other word) with maistries seems to me crimping pure and simple and as honest as any other form of theft.

Of course the Commission can advertize the attractions of subscribing estates and ignore the other but provided the advertisements are truthful they will find it difficult to advertize against the non-subscribing estates. For instance the place across the road may join the Commission and my estate not. Climate, pay and working hours are probably identical. Line accommodation may be better or worse.

Rate of pay.—I asked Mr. Barber whether the Commission could do anything to regulate this and I am glad that he agrees with me that it cannot. Any attempt to do so would be bound to fail.

I sum up therefore that the advantages to be forseen are increased discipline among coolies and maistries, an active propaganda enabling us to compete with foreign competitors on more even terms and a distinct check on fraudulent maistries and coolies with a consequent reduction of bad debts. All important points which are worth striving for I admit.

Against the Commission I hold the cost is excessive for the work it will do. That the control of the Commission is far too much vested in the hands of one firm and that it will actually precipitate a labour crisis in the coffee district.

I have heard that it is now proposed to start the Commission even if the whole 100,000 acres is not forthcoming. I presume that all subscribers would need to be asked if they agree to this, as a Commission naturally is stronger the larger its acreage.

Mr. Barber pertinently says, "You admit that most districts would be better for some organised control of their labour, that foreign competition must be met and fraudulent maistries suppressed, failing the Commission what can be done." This is a fair question and I have thought on it and come back to my old heresy.

Mr. Barber admits that the West Coast labour is not so out of hand and so far has not been to a great extent exploited by the overseas recruiter.

Then I ask myself are the K.D.H.P Commission and the agency Mr Richardson has started necessary to the rest of S. India and I am bound to admit I do not think they are. Let the Travancore Districts combine if they want to and work the Tinnevelly labour which hardly interests another district, and let us who use West Coast labour combine to regulate it and protect it from the foreign competition.

Mysore and Coorg with Malabar, Cochin and Travancore as far South as Mundakayam have all a common interest in West Coast labour, as have certain estates in Wynaad. An eight anna cess would I fancy bring in a sufficient acreage and revenue for an efficient Commission to work all S. Canara and Malapuram districts, sufficient at any rate to make a stand against foreign competition and to prevent maistries and coolies taking two advances and generally improving the discipline of our labour force. Our rubber places are far more interested in Malapuram labour, in fact we have yet to prove what S. Canara labour is worth as tappers, We knew already that a lot of it is unsuitable. You cannot as far as I can see get away from tea as an active competitor but whereas the Commission as proposed would at once stimulate the demand from the tea districts. This West Coast Commission would check it to some degree, as an estate which at present employs only Tamils would think twice of binding itself for 5 years to a second Commission merely to give a new class of cooly a trial, especially if it is already paying dearly for a Tamil Commission.

I should object to the West Coast Commission advertizing one product against another, but let it confine itself to preventing advances being given out to maistries and coolies under advance already and advertising the futility of emigration when work is to be had close at hand.

There remains the Nilgiris, Wynaad and Anamalais. Their difficulties are greater than ours and the expense of putting their house in order and withstanding competition from over the sea would be undoubtedly greater, but in case of Wynaad I understand the Agents which represent the greatest interests are in any case against the Commission.

What is the object of Mysore, Coorg and the West Coast paying for others troubles when they can attend to their own at least equally efficiently and at a quarter of the cost?

Yours etc.,
A. H. MEAD.

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea. or fine roots.

The process is repeated at the other places selec'ed, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether and is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part in 20 of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzene. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent, if possible 4 or 5.

Every specimen should be clearly label'ed so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,

The United Planters' Association of Southern India,

BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We very much regret to call attention to the fact that not one single acre has been added to the Labour Department this week. Seven weeks only remain to subscribe the 17,727 acres necessary to establish the Department or roughly 2,532 acres weekly from now to July 1st. We know that there are several strenuous upholders of this scheme who are putting off from day to day the putting on of their acreage as definite supporters, and by thus delaying add an apparent but fallacious argument to those who oppose it, that there is no unanimity amongst themselves and present them gratuitously with an additional reason for standing aloof. These firm believers in the necessity for a Labour Department, through thoughtlessness and supiness are more likely to wreck the scheme, than the out and out opposers of it. To these men we appeal to send in their acreages without delay.

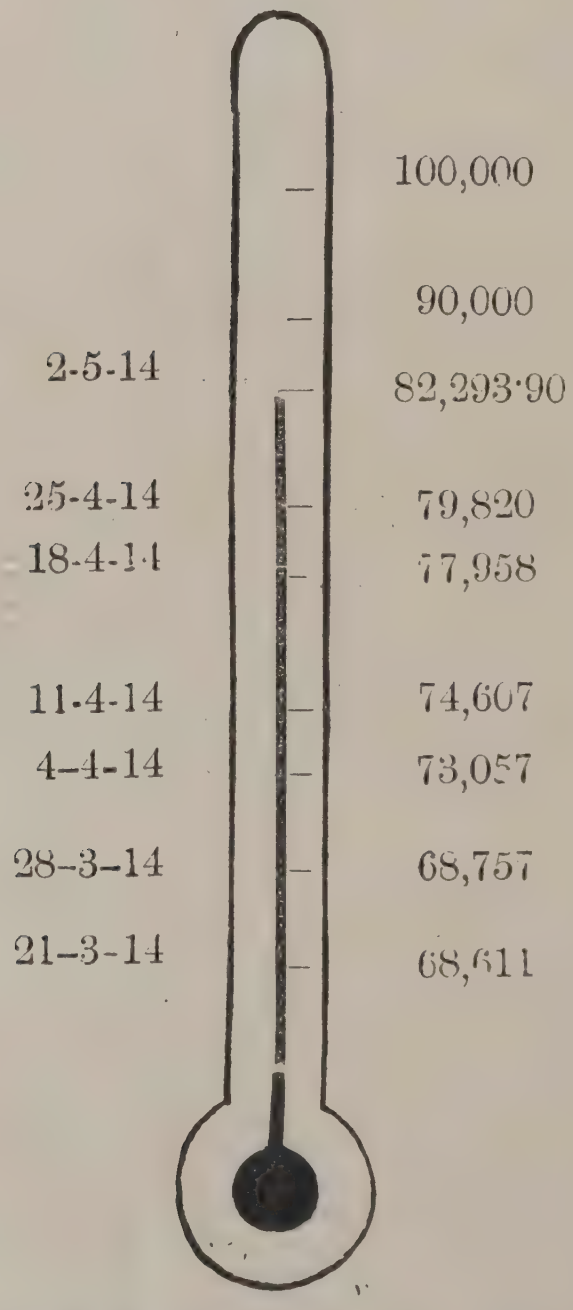
Under the heading of U. P. A. S. I. we have made an extract from the Ceylon Labour Commissioner's Report for 1913 which should be carefully read by one and all. Just as we have, Mr. Scoble Nicholson foresees increased competition in the near future, and we are of opinion that this foregin competition is more than likely to strengthen "the better mutual understanding" that now exists between Ceylon and South India. For those who still have deluded themselves into the belief that Malayalams do not emigrate we extract from the same Report, a warning. "Cannanore Agency." "There is a large supply of labour available in Malabar and at present the greater proportion of this Labour goes to the Straits and Assam. There are said to be 6,000 Malayalams in the Straits and they are evidently a success as they continue to go. I have lately appointed a new Agent a local man of some influence and a Revenue Pensioner." Verb. Sap. It would be far better to insure at once against the continued and increasing exodus of labour that is almost indispensable in the South.

We call attention to the Potash Syndicate's Coffee Manuring Experiments drawn up by Mr. Birnie. It is a simplified and supplementary scheme.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

NITROGEN.

The Sources of the Nitrogen of Vegetation.

The results of the whole inquiry carried out by Mr. J. B. LAWES, DR. GILBERT and DR. PUGH on the sources of the Nitrogen of vegetation, etc., may be very briefly enumerated as follows :—

The yield of nitrogen in the vegetation over a given area of land, within a given time, especially in the case of Leguminous crops, is not satisfactorily explained by reference to the hitherto quantitatively determined periodical supplies of combined Nitrogen.

Numerous experiments have been made by M. BOUSSINGAULT, from which he concludes that free or uncombined Nitrogen is not a direct source of the Nitrogen of vegetation. M. G. VILLE, on the other hand, concludes, from his results, that free Nitrogen may be a source of a considerable proportion of the Nitrogen of growing plants. The views, or explanations, or other experiments, on this disputed point, are various and inconclusive.

It was found that the conditions of growth adopted in our own experiments, on the question of the assimilation of the free Nirogen by plants, were consistent with the healthy development of various Graminaceous plants, but not so much so for that of the Leguminous plants experimented upon.

From the results of various investigations, as well as from other considerations, we think it may be concluded that, under the circumstances of our experiments on the question of the assimilation of free Nitrogen by plants, there would not be any supply to them of an unaccounted quantity of combined Nitrogen, due either to the formation of oxygen-compounds of it under the influence of ozone, or that of ammonia under the influence of nascent hydrogen.

We have found that free Nitrogen is given off in the decomposition of Nitrogenous organic matter, under certain circumstances. But considering the circumstances of such evolution, and those to which the nitrogenous organic matter necessarily involved in experiments on the question of the assimilation of free Nitrogen by plants is subjected, it may, we think, be concluded that there would be no loss of combined Nitrogen from this cause in such an experiment, excepting in certain cases, when it might be presupposed.

Our experimental evidence, so far as it goes, does not favour the supposition that there would be any loss of combined Nitrogen in our experiments on the question of assimilation, due to the evolution of free Nitrogen from the nitrogenous constituents of the plants during growth.

In numerous experiments with Graminacious plants, grown both with and without a supply of combined Nitrogen beyond that contained in seed sown, in which there was great variation in the amount of combined Nitrogen involved, and a wide range in the conditions, character and amount of growth, we have in no case found any evidence of an assimilation of free or uncombined Nitrogen.

In our experiments with Leguminous plants the growth was less satisfactory ; and the range of conditions possibly favourable for assimilation of free Nitrogen was, therefore, more limited. But the results recorded with these plants, so far as they go, do not indicate any assimilation of free Nitrogen. Since, however, in practice, Leguminous crops assimilate from some source, so very much more Nitrogen than Graminaceous ones, under

ostensibly equal circumstances of supply of combined Nitrogen, it is desirable that the evidence of further experiments with these plants, under conditions of more healthy growth, should be obtained.

Results obtained with some other plants are in the same sense as those obtained with Graminaceae and Leguminosae, in regard to the question of the assimilation of free Nitrogen.

In view of the evidence afforded of the non-assimilation of free Nitrogen by plants under the wide range of circumstances provided in the experiments, it is decided that the several actual or possible sources of combined Nitrogen to plants should be more fully investigated, both qualitatively and quantitatively.

If it be established that the processes of vegetation do not bring free Nitrogen into combination, it still remains not very obvious to what actions a large proportion of the existing combined Nitrogen may be attributed.—*The Tropical Agriculturist.*

Manuring.

Colonel E. Vansittart writes as follows to the *Financial Times* on the above subject.

"There are still many directors of rubber Companies who do not believe in the necessity of manuring trees, which to me seems extraordinary. In a primeval jungle whatever is taken out of the soil returns in the shape of fallen leaves, broken boughs, etc., to form fresh soil, and nothing being removed no soil exhaustion takes place. On the contrary, whatever the roots derive from the soil, and whatever the trees, their branches, their leaves, flowers and fruit derive from the sun, the rain and the air, returns as a solid to the earth, making the surface deeper and richer every year. But take a cabbage patch and crop it for three years without manure and you will surely not get a good crop at the end of the third year. The same applies to rubber plantations. The fact of having planted the rubber trees in virgin soil may stall off for some years the necessity of manuring, but most assuredly that necessity will arrive in time, or soil exhaustion will follow. In my opinion every tree tapped should be manured."

F. M. S.

Export of Rubber for 1914.

The Commissioner of Trade and Customs gives the following figures in regard to the export of rubber from the F. M. S.

Exported during March	...	... Tons	2,417·69
Previously (January and February)	...	... „	4,906·11

It will be seen that in the first three months of the year the monthly exports were equal, and at this rate would not amount to more than 30,000 Tons. There is a falling off usually at the beginning of the year owing to wintering of the trees, but we attribute it to more conservative methods of tapping all over the country.

Comparing the exports for the first quarter of 1914 with that of 1913, we find the increase is not more than 30%, so that the chances of the output being double of that of 1913 seems rather remote.

The value of the rubber exported for the first three months of 1914 is given as $12,761,888 and the export duty that has passed into the Government coffers amount to $318,441.—*Greniers' Rubber News.*

U. P. A. S. I.

We have only at the moment of going to press received the *Planting Gazette* of The Planters' Association of Ceylon. We extract the last portion of the Ceylon Commissioner's able Report for 1913 which comes at an appropriate moment, to stimulate the exertion of those who are merely waverers in the cause of the Labour Department, and to convince those who oppose its establishment, that others, equally if not more experienced, view the future of labour in South India with anything but equanimity.

"At the courteous invitation of the Chairman of the above Association, I attended the Annual Meeting of the Delegates during August. I am glad to think that the result of my visit has been to arrive at a better mutual understanding. I was able to assure the Planters of South India that recruiting within the planting area of South Indian Estates by Ceylon recruiters would be effectively stopped if brought to my notice and if within my power to do so. I was glad of the opportunity to meet many of the leading Planters of the Presidency and to learn their views on labour matters generally. As a result of my visit I look forward to nothing but friendly rivalry between Ceylon and South India, and the prospect of our being able to amicably adjust any differences that may arise in the future. The chief feature of the Meeting was to consider the proposals to form a Labour Commission for South Indian Estates. Since that Meeting these proposals have culminated in a scheme which at the time of writing appears to have every chance of going through. The planters of South India are thus organising to improve conditions of recruiting and attract the labour which is already at their doors, and propose to spend no less than Rs. 2 an acre to accomplish what they are setting out to do. At the head of their Commission will be a gentleman whose ability and experience of the recruiting Districts of South India is second to none. During the year Ceylon has held its own in competition with other countries which has been as keen as usual, but with the South Indian organisation an accomplished fact, it will certainly be necessary to make strenuous efforts to keep pace with the situation. Assam now desires to come further South for her labour and Tamils are required for opening land and for the cultivation of tea in the hills of Burmah and lastly, we hear that Jamaica is entering the lists. Even the firm of Lever Brothers are looking towards the recruiting grounds of South India for assistance in the cultivation of the coconut (for the manufacture of their soaps) in the South Seas. There is thus every indication that unless we exert ourselves to a greater extent, we may be overtaken in the organised competition for labour in South India even with the good start we have already made by the establishment of a Labour Commission for the last ten years. There is much work to be done, advertising the increased attractions and improved conditions that undoubtedly exists on Ceylons Estates at the present time, together with the opening of the new Railway route to Ceylon with its short sea journey. More control of the Kanganies' operations in South India is essential. It is worth considerarion whether an extension of our work in South India should not be brought about simultaneously with the present great movement in Ceylon to place the labour question on a more satisfactory basis.

(Signed) H. Scoble Nicholson.
Ceylon Labour Commissioner.

Trichinopoly, 1st April, 1914.

BASIC SLAG.

The great importance and extensive use of Basic Slag as a manure make it desirable to remind intending users of a few points as to its purchase, and its use on different soils and crops.

Basic Slag, as is well known, owes its value to the fact that it contains phosphate of lime in a more or less readily available condition. It usually contains also a considerable proportion of lime capable of neutralizing acids in the soil, though probably not more than 2 to 5 per cent. is in the form of "free" or "caustic" lime. Obviously, then, the first thing to be ascertained in buying basic slag is the percentage of phosphate of lime which it contains. Furthermore, the availability of the phosphate in different samples varies. As a rough guide to determine whether the phosphate is likely to become "available" or useful to plants in a reasonable time, a method often adopted, and officially recognised under the Fertilisers and Feeding Stuffs Act, is to ascertain the percentage soluable under standard conditions in a 2 per cent. solution of citric acid. While this method is only expected to give approximately correct information, it may safely be assumed that the value of a sample of slag is roughly proportional to its content of phosphate soluble in the approved solution of citric acid.

Fineness of Grinding.

As influencing the availability, the fineness of grinding is extremely important, and along with the guarantee of the amount of phosphate present, a statement as to the proportion of the slag which will pass through a sieve having 10,000 meshes per square inch should be obtained. This proportion should not be less than 80 per cent. and samples 90 per cent., of which will pass through the sieve are readily obtainable.

Most suitable grade of Basic Slag.

There is often discussion as to what is the most suitable quality of basic slag for general use. It is possible to obtain slag called basic slag containing very little phosphate at all, while on the other hand, the richest samples contain up to 50 per cent. of "total phosphate of lime." The solubility of this total phosphate, however, varies very much in different samples, and there is no definite relation between the richness of slag in phosphate and its solubility. For instance, in one of a series of samples of which detailed analyses are available, the total phosphate of lime amounted to 27 per cent., and 93 per cent. of this was soluble in a 2 per cent. solution of citric acid; in another containing 45 per cent. total phosphate of lime, only 70 per cent. was soluble; in still another sample, containing 20 per cent. total phosphate of lime only 66 per cent. was soluble.

This question of which quality should be used is chiefly one of cost. From the crop's point of view, what is required is a sufficient supply of available phosphate, and whether this is supplied by a small quantity of a high quality slag, or a large quantity of a low quality slag, is immaterial. Every farmer intending to use basic slag should obtain quotations for different grades from one or two merchants, and calculate what 1 per cent. of citric-acid-soluble phosphate would cost him in each case. As an example, a case which recently came to notice may be quoted. Two grades of slag, containing 26 per cent. and 34 per cent. "citric soluble phosphate" were offered at 45*s.* and 55*s.* a ton respectively, both quotations including carriage; the cost of 1 per cent. citric-acid-soluble phosphate in the first case is 45*s.* divided by 26, or 1*s.* 8¾*d.*; in the other case it is 55*s.* divided by 34 or 1*s.* 7½*d.* Clearly the latter is the cheaper manure

and generally speaking, it may be said that the higher qualities of slag are, really cheaper than the lower grades. particularly when the greater cost of carriage, carting and distribution of a given quantity of phosphate is taken into account. Without going so far as to say that a purchaser should insist on having a high quality slag, it is safe to say that, as a rule, one containing not less than 15 per cent. of citric-acid-soluble phosphate should be employed.

SOILS.

Basic Slag usually gives its most striking results when applied to poor pasture on heavy clay soil. The results obtained at Cockle Park and detailed in a supplement to the Journal of the Board of Agriculture and Fisheries (January, 1911), are most striking. The alkalinity of the slag renders it also a very suitable manure also for peaty and sour soils. Even very light soils deficient in lime sometimes respond well to an application of slag.

It is perhaps, well to point out that, while basic slag usually gives excellent results on poor clay soil, a small area should always be treated, and the effect observed before expending any great sum on the manure. Although it is usually not so well suited for light or chalky soils as for clays, such soils have in some cases benefited materially from its application. Here again, however, a field trial must be made before definite conclusions as to its effect can be drawn. On light soils, in addition to trying the effect of slag alone it is also advisable to test the effect of adding kainit (at the rate of 3 or 4 cwt. per acre). Potash is seldom required on heavy clays, but may be needed just as much as phosphate on light soils. On the poor pastures on which slag proves effective, nitrogenous manuring, either in the form of dung, nitrate of soda, or even cake feeding, seldom does good and often does harm. The improvement of such pastures is best effected by encouraging white clover; direct application of nitrogenous manure tends to help the grass to suppress what litle clover is present. Leaflet No. 267. BD. of AGRIC. AND FISHERIES.—*The Tropical Agriculturist.*

The Cactus as Fodder.

The question whether the prickly pear or the cactus, to give the shrub a more scientific name, can be utilised as fodder has, says the *Bombay Gazette*, been asked in India more than once, and the reply has usually been in the negative. Officials of the Agricultural Department at Poona, however, are able to report differently. It is stated in the Annual Report for 1912-1913 that during the year important experiments have been carried out with the result that it has been proved conclusively that prickly pear, if fed with 6 per cent. of cotton seed, is a valuable emergency fodder in famine times. During the famine last year six bullocks were purchased from Ahmednagar and were fed on the compound mentioned. It is said that the spines of the cactus can be burnt off with kerosine flare lamps and the pear prepared at a cost of Re.1-4 per 1,000 lb. in a day of ten hours. The food was tested practically at Manji when fodder was dear with apparently satisfactory results. Additional testimony comes from the Collector of Ahmednagar who informed the Director of Agriculture that "the demonstrations of the use of pear carried out by the Department at the cattle camps were very successful and have convinced the leading cultivators." As it is calculated that two bullocks can be fed with pear and cotton seed at a cost of less than five annas a day, and the cactus grows in abundance in Poona and many other districts in the Bombay Presidency, one of the most serious problems to be faced in famine would appear to have been solved.—*Indian Agriculturist.*

FERTILISERS.

Functions of Fertilisers.

Every farmer who reads an Agricultural paper knows that the essential ingredients which it is necessary to restore to the soil as plant food to make good the constituents extracted by the crops are principally the following :— Nitrogen, Phosphoric Acid, Potash and Lime or as they are more generally known in this country, Ammonia, Phosphate of Lime and Potash. Besides these constituents, plants make use of several others, but fortunately for agriculturists, the others are almost always present naturally in sufficient quantity in the soil, so that the farmer need not put his hand in his pocket to buy artificial supplies of them, as he has to do with those first named.

The part which each ingredient acts in the growth of the plant, and the reaction of one ingredient on another is exactly known, and continue to form a fruitful subject for hypothesis and investigation but, generally speaking, the following functions are attributed to them :—

Nitrogen is absolutely indispensable and enters into the composition of all the growing parts of a plant. It is Nitrogen which gives to vegetable products, such as Cereals, in those nutritive qualities which render them valuable as nourishment to man and animals. It is nitrogen which produces the albuminoids in hay, the flesh of animals and the caseine in milk. It is the want of this constituent that causes the leaves of corn in a backward spring to be yellow, a sure indication that a top-dressing of an active nitrogenous fertiliser is desirable.

Phosphoric Acid is found in every part of plants, but accumulates more especially in the seed. It is also the principal constituent in the bone formation of man and animals, and where it is wanting in the soil plants grow feebly and animals do not thrive. In some parts of Europe where the character of the soil so is granatic and deficient in phosphoric acid, both horses and cattle remain small, in stature and feeble. Their bones are so weak and brittle that they possess no resisting power and have been known to break from a mere blow. In such districts the liberal use of basic slag and superphosphates will gradually make an enormous change.

Potash.—Potash is always abundant in the ash of plants. When this constituent is deficient the plant cannot grow vigorously, because in the absence of a sufficient supply of potash the green matter of the plant is not able to elaborate those substances which are indispensable for the formation of new organs.

Lime plays an important roll in the soil in causing the decomposition of animal and vegetable matter, in promoting nitrification, in rendering the soil, potash soluble, etc. It is also utilised to a small extent by the plant as plant food, but its principal advantage is more in the way of its action on other ingredients in the soil.

Now, if one or other of the constituents is naturally abundant in an available condition in the soil, it would be waste to apply further quantities in the form of artificials ; but, on the other hand, if one is deficient, the plant cannot make proper use of the others.

The crop is then governed by what is termed the "law of a minimum"; it can grow only up to the limit of the ingredient present in insufficient quantity.

In this respect, plants may be compared to a stone mason, who with different materials, sand, lime and water, compounds mortar. But of what use to him would be a big heap of sand if he had no lime ?

In the same way a plant requires all the constituents for its growth ; if one is present in insufficient quantity, its growth is arrested when that limited quantity is used up.—*Mark Lane Express Agricultural Journal.*

RUBBER INDUSTRY OF BOLIVIA.

Varieties Produced and Methods of Collection.

H. M. Minister at La Paz has forwarded the following particulars relative to the rubber industry of Bolivia :—

Bolivia ranks as the second rubber exporting country of South America, coming next to Brazil, with an annual output of over 2,000 tons. The exports of rubber in 1912 were as follows :—fine rubber 1,354,704 kilogs; "caucho" 689,401 kilogs., and "cernamby," 166,241 kilogs; making a total of 2,210,346 kilogs., compared with a total of 1,643,576 kilogs. in 1911. The total exports of rubber for the first three months of 1913 amounted to 1,100,741 kilogs. The quality of the rubber is excellent. There are just the three grades, named, *viz*: "fina" (fine), "caucho" (Caoutchouc), and "cernamby" (scrap or niggerhead).

Four varieties of rubber trees are worked in Bolivia : (1) the "Morada" which is abundant in the swampy low-lying ground ; (2) "Blanca" which grows on the highlands ; (3) "Amarilla," and (4) "Itauba" which, though giving less quantity, is equal in quality to "Morada." The average yield of latex is stated to be eight lbs. per tree, but virgin trees give considerably more. Many trees have to be "rested" for a number of years in order that they may recover from the ill effects of the native method of tapping, which is described below. In many cases trees are rendered useless through having the "cambium" penetrated by the axe, and being then attaeked by white ants or "borers." The best season for tapping is from May to the middle of August, but the trees are again tapped from 1st October to 15th January. The flowering season is in December and January and the pod ripens in March and falls to the ground towards the end of April.

The rubber forests are divided into "estrades" or paths cut in the jungle, and each "estrada" contains from 100 to 120 trees, the distance between each tree being usually so considerable as to entail a great loss of time on the part of the "freguez" or collector, whose duty it is daily to visit the trees and collect the rubber. This employee does not receive a regular wage, but gets 25 bolivianos (£2) per arroba (25 lbs.) of fine rubber, and 15 bolivianos (£1 4s) per arroba of "caucho". The "mozo" or unskilled labourer is paid a monthly wage of 40 to 60 bolivars (£3 4s to £4 16s.), and although these figures would appear to be a reasonable remuneration, the fact that the workers are obliged to purchase all their supplies from the store which is always run in connection with the rubber industry, where the prices charged are usually excessive, renders it practically impossible for these men to keep out of debt.

The axe used in Bolivia for tapping is smaller than the Brazilian "machadinho," but nevertheless the ruthless methods in vogue for the extraction of the latex cause almost, if not quite, as much damage in the one country as in other. The method of tapping is as follows :—

The collector visits his "estrada" at dawn, and having first collected the scrap which has oozed from the trees, he proceeds to make a series of deep cuts. These cuts are first made as high up the trees as possible and at intervals of 18 inches each day. Beneath these, metal cups, varying in number from three to six are affixed in the bark just below the wound to catch the latex. After treating each tree in a similar fashion, the collector now returns to the first one bled, and collects the latex in a pail, visiting each tree in turn until he has a pail full of the liquid, which he brings back to his hut for the process of coagulation.

RUBBER.

Leaf Disease of Hevea.

In the Eastern Tropics, the leaf diseases which have been recorded for *Hevea brasiliensis* have been confined to nursery plants and have not caused serious damage. In South America, however, there would appear, from the accounts of different investigators, to be at least one which is more dangerous than those known in the East in that it attacks both old trees and nursery plants.

The fungus which causes the disease was first described by HENNINGS in 1904 under the name of *Dothidella Ulei*. The specimens had been collected by ULE in the Upper Amazon Valley, Jurua (Acre Territory) on the banks of the Rio Jurua Mirum (Acre Territory), and on the banks of the Amazon in the neighbourhood of Iquitos (Peru). HENNINGS did not give any account of the injuries caused by the fungus, DR. HUBER, however, on the occasion of his visit to Ceylon stated that it sometimes caused serious damage and defoliated the trees.

Recently, the fungus has been re-described by GRIFFON and MAUBLANC from specimen obtained on nursery plants at Belem. These authors do not consider that it is likely to cause a serious disease. They state that on old trees the injury is doubtless insignificant, and only nursery plants could be seriously injured. GRIFFON and MAUBLANC found, on the same leaves as the *Dothidella*, conidia and pycnidia which they regard as stages of that fungus, a discovery which gives occasion for a revision of the known facts relating to the leaf diseases of Hevea in South America.

In 1911, DR. J. KUYPER described what was considered a different leaf disease of Hevea from Surinam. This disease occurs in three forms. In the first stage, the young leaves, only three to five days old, exhibit sub-transparent, olive green or dark green patches, which are sometimes so numerous that the whole leaf blackens and collapses. In the nurseries, sometimes every plant is attacked. Hevea leaves grow rapidly and apparently the fungus cannot attack the older tissues. Consequently, the disease is, in many cases, limited to the original spots, the centres of which turn yellow and fall out, so that the leaf becomes perforated. At the edges of the holes, small black bodies are produced, often in such numbers that they form a closed ring. This perforation of the leaf is KUYPER'S second form. The fungus can also occur on the leaf stalks and stems, where it produces swollen areas which may form canker-like patches ; this is the third form.

The fungus of the surinam disease was described as a *Fusicladium* and was named *Fusictadium macrosporum* Kuyper. It occurs on both *Hevea brasiliensis* and *H. guyanensis*. KUYPER states that nursery plants are often strongly attacked. Its occurrence is irregular, and that, he considers, may be accounted for by the fact that Hevea drops its leaves twice a year. After the leaf-fall, trees previously seriously attacked often produce sound shoots. For that reason, the injury resulting is small. Weak plants often die, and even six-year old trees may succumb to repeated attacks. Kuyper advises that old trees which are repeatedly attacked should be removed, that plants which show the second stage should be sprayed with Bordeaux Mixture to kill the spores which appear then, and that, in nurseries, upper parts of stems which bear the third stage should be cut off.

From a comparison of KUYPER'S description and figures with those of GRIFFON and MAUBLANC, it would appear that these authors are dealing

with the same fungus. The pycnidia and pycnospores described by GRIFFON and MAUBLANC are identical with those described by KUYPER as occurring with his *Fusicladium*, while the conidia of the former authors agree with the *Fusicladium* spores of KUYPER. An exact comparison cannot be made as several essentil details are omitted from the descriptions, but the coincidences are so close that there does not seem to be much room for doubt.

More recently, BANCROFT has recorded another leaf-disease, from British Guiana. The symptoms were "a spotting of the leaves, followed by an increase in the size of the spots, with the production of dried areas which eventually fall away from the green parts leaving holes in the leaf surface." The disease is said to have been "not particularly abundant." Specimens of the fungus were forwarded to Kew, where it was considered to be a new species, and named *Passaloro Hevea* Mass. The description of the fungus is not available, but it may be pointed out that *Passalora* is a genus closely resembling *Fusicladium* and only doubtfully distinct from the latter. It would appear probable therefore that the British Guiana leaf disease is the same as those of Brazil and Surinam.

If these conclusions prove correct, Hevea throughout South America is subject to a leaf disease which can attack both old and young trees. It is unnecessary to point out the bearing of this on the proposal to establish plantations of Hevea in its native country.

Soya Bean.

As was confidently expected, the soya bean has been greatly improved in the past few years, both in America and Europe. Whereas in its home country of Manchuria the oil content is only about 15 or 16 per cent., some of the new varieties which have been bred up in America and Europe run as high as 20 and even 22 per cent. South Africa is now taking up this crop and it is found that altitude somewhat affects the yield of oil in any given variety; for instance, at an altitude of 1,000 meters the yield of a certain variety is about 20 per cent. while at sea level it is about 22 per cent. Germany, ranking with France as the heaviest importer of all seeds, has been trying for years to find a suitable oil crop which could be put under intensive cultivation; this desire seems about to be realized in the shape of soya, many varieties of which can now most likely be grown in Germany with excellent success. In 1912 Germany imported 1,443,447 metric tons of oil seeds valued at 217 million pesos.—*Phillippine Agricultural Review.*—(*The Tropical Agriculturist.*)

CEYLON.

Rubber Exports.—The following statistics of the exports of rubber of domestic production from Ceylon during the month of November, and the eleven months ended November, 1912 and 1913, have been extracted from official returns issued by the Ceylon Government;—

To	Nov., 1912.	Nov., 1913.	Jan-Nov., 1912.	Jan-Nov., 1913.
United Kingdom ...	887,156	1,581,655	7,157,605	12,458,869
United States ...	637,192	508,358	4,116,776	5,476,012
Other Countries ...	168,237	417,799	1,735,958	4.373,665
Total exports of rubber of domestic production ...	1,692,585	2,507,812	13,010,339	22,308,546

—*The Board of Trade Journal.*

COFFEE.

The effect of the small reduction in the world's visible supply of only 185,000 bags, compared with 348,000 last year, has soon passed away, and it is realised that it is due more to an increase in the arrivals of mild and of Brazilian kinds than to decreased deliveries. In the first three months of this year the deliveries in Europe and the United States were 711,000 bags more than the average of the last four years, a very substantial quantity, and more than sufficient to take up the whole of the increase in the Brazil crop, if deliveries continue on the same scale throughout the year. That all kinds are plentiful at the moment, and that importers of mild descriptions are always anxious sellers, are points in favour of lower rates, but the fact that prices have already fallen below what they have been for several years, and that dealers are believed to be short of stock, are points against any further fall. In fact, with the knowledge of a small Brazilian crop next year, values appear to be quite low enough. Supplies have again been heavy on the two days that auctions have been held. East India continues to be unsatisfactory in quality, but Costa Rica, although not as fine as in some years, as a crop is quite useful and is safe to stock.

LONDON COFFEE RETURNS.

	* Home Consumption.		Export.		Stock.	
	1914	1913	1914	1913	1914	1913
For week ended	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
April 4 ...	315	377	552	459	21,906	14,463
For 14 weeks ended						
April 4 ...	4,389	3,945	5,324	4,050	—	—

* The Home amount contains a proportion for export delivered by cart.

—*The Produce Markets' Review.*

OUR OVER-SEAS TRADE.

Our exports in February were valued at £41,261,797—an increase of £1,089,054 compared with February, 1913, and £3,771,468 more than the total for February, 1912. As compared with last year's figures the chief advances were shown by machinery (£320,985) and cotton fabrics (£519,466). Manufactures of wood and timber, including furniture, leather and manufactures thereof, and railway carriages and trucks were among the items showing improvement. There was a falling-off in iron and steel manufactures, other metals and manufactures thereof, cutlery, hardware implements and instruments, electrical goods and apparatus.

Imports during February were valued at £62,050,744, a decrease on the February returns last year of £1,736,406.

The decrease in the value of the imports is mainly accounted for by lower totals in the class of raw materials and articles mainly manufactured, the total under this heading being £2,633,784, less than that in February, 1913. Among articles wholly or mainly manufactured there were several small increases, including one of £386,278 in metals and manufactures other than iron and steel, and another of £137,945 in silk. As compared with February, 1912, the month's imports showed an advance of £2,335,921.—*Export World and Commercial Intelligence.*

TEA.

A Suggested Reason for the Decline in the Manufacture of Green Tea in Ceylon—is, that in South Russia and Persia 1913 was a bad year for trade, and the demand from those centres fell off after having previously been steady for several seasons. There is probabiy another reason says an American correspondent one which, likely, is not very wide of the mark, and that is the question of flavour. Most of the large green tea consuming countries are believed to sip their tea from glass tumblers of diminutive shape, called, in the glass trade "tots", and sometimes a small modicum of lemon juice is added to develop the flavour. Ceylon green tea is generally of good quality from a market point of view and if not too obtrusive in the colour of the leaf can be used to advantage in blending with black teas which are deficient in point of pungency, but when it comes to drinking it neat, "even with the modicum of lemon" it is more than probable that the flavour of a China green tea would be preferred by the average consumer.—*Ceylon Observer.*

Tea in Russia.

The annual consumption of tea in Russia is over 140,000,000 lb. Of this enormous quantity about two thirds are imported from China in the form of compressed blocks either tablets or briquettes. The best quality of compressed tea (according to M. H. Jumelle, who writes an interesting article on the subject in the G. *Journal d'Agriculture Tropicale*) is contained in the tablets. The waste powder in the process of manufacture is sifted, and the fragments of leaves are made into tablets, which are subjected to great pressure for some time, and then wrapped in tin foil and white paper. The briquettes are made from the siftings, which consist of stems and leaf-stalks. They are pressed into blocks, and subjected to a current of steam for three minutes. The briquettes are made of both black and green tea. The tablets weigh about ¼ lb. each, and are packed in wooden lead-lined boxes. The briquettes of black tea weigh from ½ lb. to 3 lb., while those of green tea are made up in two qualities, the best quality weighing 1½ lb. and the inferior 3¼ lb. They are packed in bamboo baskets lined with leaves. Attempts have been made to cultivate tea in Russia since 1848. It is grown in the Caucasus, especially on the south-east side of the Black Sea, where the climate is warm and moist and the soil a fertile red clay. The annual production is about 13,000 lb. The first picking takes place about 4 years after the bushes have been planted, and the three or four pickings are made each year. This tea does not possess the fine aroma of the best Chinese qualities, and is used mainly by the poorer classes, who buy it in the form of briquettes.—*Royal Society of Arts Journal*, April 3.—*Ceylon Observer*, April.

Federated Malay States.

Rubber Exports during March, 1914.—The following figures of the exports of cultivated rubber from the Federated Malay States during the month of March, 1914, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for 1913 being added for purposes of comparison.

	1913.	1914.
	Lbs.	Lbs.
March	1,737	2,418
January-March ...	5,625	7,324

—*The Board of Trade Journal.*

EXPERIMENTS.

Potash Syndicate Coffee Manuring Experiments.

In Vol. VIII No. 9 of the *Planters' Chronicle* of 1st March, 1913, was published the scheme of Experiments to be conducted in Coorg and Mysore under the auspices of the U. P. A. S. I.'s Scientific Department and under subsidy from the Potash Syndicate. All the Experiments as planned therein were laid down last year. When harvesting operation commenced, however, a number of experimenters experienced difficulty owing to the pressure of work, shortage of labour, time and facilities in obtaining the statistics required. Some of these experimenters in Coorg have intimated that they are unfortunately, unable to continue these experiments another year.

In order to meet the difficulties experienced by these, a simplified supplementary scheme is given hereunder which, it is hoped, will be taken up and meet with better success.

Experiments.	Plots.	Manures in Cwts. per acre.		
I.	1	Control (No manure.)		
	2	Steamed Bones 3	Poonac 2	
	3	Steamed Bones 3	Poonac 2	Sul. of Potash. 1
II.	1	Control (No manure.)		
	2	Basic Slag 3		
	3	Basic Slag 3	Muriate of Potash 1	
	4	Basic Slag 3	Muriate of Potash 1	Nitrolim 1
III.	1	Control (No manure.)		
	2	Steamed Bones 3	Poonac 3	
	3	Steamed Bones 3	Poonac 3	Sul. of Potash 2
	4	Steamed Bones 3	Poonac 3	Sul. of Potash 1
	5	Steamed Bones 3	Poonac 3	Sul. of Potash ½
IV.	1	Control (No Manure.)		
	2	Neutral Super. 3	Poonac 2	
	3	Neutral Super. 3	Poonac 2	Muriate of Potash 1
	4	Neutral Super. 3	Poonac 2	Sul. of Potash 1

Experiments.	Plots.	Manures in Cwts per acre.		
V.	1	Control (No manure.)		
	2	Basic Slag 3	Poonac 3	
	3	Basic Slag 3	Poonac 3	Sul. of Potash 1
	4	Steamed Bones 3	Poonac 3	Sul. of Potash 1
	5	Neutral Super. 3	Poonac 3	Sul. of Potash 1
VI.	1	Control (No manure,)		
	2	Steamed Bones 3	Poonac 3	
	3	Steamed Bones 3	Sul. of Potash 1	Cal. Nitrate 1
	4	Steamed Bones 3	Sul. of Potash 1	Nitrolim 1
	5	Steamed Bones 3	Sul. of Potash 1	Poonac 3
VII.	1	Control (No manure,)		
	2	Steamed Bones 4	Poonac 4	
	3	Steamed Bones 4	Sul. of Potash. $1\frac{1}{2}$	
	4	Sul. of Potash $1\frac{1}{2}$	Poonac 4	
	5	Steamed Bones 4	Sul. of Potash $1\frac{1}{2}$	Poonac 4

In this scheme, it will be noted, an attempt is made to solve only a few simple problems. Each experiment is designed to test the necessity, or otherwise, of Potash and in addition.

Experiment 1, contrasts the older method of manuring, *e.g.* (Phos. acid and Nitrogen) with a complete manure (Phos. acid, Nitrogen and Potash).

Experiment 2. is designed to show whether sufficient Nitrogen is obtained from Mulch.

Experiment 3, ought to show the approximate suitable quantity of Potash to apply.

Experiment 4, contrasts Muriate with Sulphate of Potash.

Experiment 5, contrasts the forms of Phosphoric acid.

Experiment 6, contrasts the forms of Nitrogen.

Experiment 7, is designed to show, by leaving out one of the plant foods in rotation, which is the most needful constituent of any coffee manure.

The scheme in principle was approved of by Mr. Anstead before his departure for Home. At the same time, the hope is expressed that as many as possible of the experimenters under the old scheme will continue their experiments under that scheme ; while others who found the old scheme made too great demands on their time and labour at harvest may take up one of the above experiments.

Except in experiments V & VI where it is not feasible, the manures shall be weighed, mixed, labelled and forwarded to the estates ready for application to the individual plots so as to simplify matters as much as possible.

The manures should be broadcasted and forked in or otherwise incorporated with the soil. This is essential, for, though Potash is water-soluble it neither washes into, nor out of, the soil, and, unless forked in, simply lies on the surface and is liable to be carried off by Monsoon wash. Similarly with superphosphate and the "bulky" manures. Nitrates alone wash down into the soil, thereby reaching more than merely surface roots.

To keep the scheme as simple as possible the following will constitute the only

Essential Data.—1. Each Plot to be numbered and marked with name board.

2. Area of Plot and number of trees.
3. Manures applied and date of application.
4. Cost of manuring.
5. Weight of crop from each plot.

Further, in order to popularize the experiments, suggestions by any planter desirous of undertaking an experiment will be welcomed and considered with reference to his own particular case.

ROBT. BIRNIE,
Agrl. Officer of the Potash Syndicate.

REPORT ON TRADE OF THE CONGO FOR THE YEAR 1912.

Agriculture.—This is of the most rudimentary description amongst the natives and is carried on principally by the women. A description of native methods and of the steps which have been taken by the Belgian Government to improve matters was furnished in the last Annual report (Annual Series No. 5043) In certain districts of the Congo the natives are more skilled in agriculture than in other districts. In the district of Kivu, for example, the tribes show considerable skill in tending their herds of cattle. Rice is successfully cultivated on the Upper Congo. On the Kasai River agriculture is carried on extensively by the natives, who use the honey thus obtained as an article of exchange and for the manufacture of alcoholic beverages. In general, however, the native tribes are little disposed to furnish the labour and attention required. Vast areas of the Congo consist of forest and swamp or of rocky hills covered with bush, quite unfit for agricultural purposes. In a primitive state, moreover, the wants of the native are few. Manioc and palm oil, which are his principal articles of diet, can be obtained without much labour. It is to be hoped that the quickening influence of commerce and the new needs created by contact with the European will prove an incentive to greater effort.

The new Department of Agriculture created by the Belgian Government is doing good work in the direction of collecting and disseminating information.—*Diplomatic and Consular Report, Congo, Anl. Series* 5260.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

It is with renewed regret that we have to inform our readers that the Labour Barometer has not risen a single degree since our last issue, and there only remain six weeks to make up the required acreage. We know of owners perfectly willing to put their acreages on, but who from day to day defer doing so. To these men we appeal to at once send in their acreages, thus affecting a rise in the Barometer, influencing those who are still "sitting on the fence." Surely these men will not be content to be known as "The Wreckers" of a scheme, fraught with great future possibilities, and the settlement of a long vexed question.

This issue of the paper contains three letters in answer to Mr. Mead, which we trust will lay the ghost of all of the contentions raised by him. It would be invidious to prefer one letter to another, but cannot refrain from calling special attention to the appeal made by Mr. Danvers to "look ahead." All three letters are most interesting and Mr. Barber's letter to Mr. Mead should be read in conjunction with that to the Editor.

We have received an anonymous letter from a correspondent on the same subject, signed "Nous Verrons." As the letter came unaccompanied by the author's name, we regret we cannot publish it, but shall be happy to do so if the writer of the letter will forward his name, not for publication, but as a *bona fides*.

We should feel very much obliged if correspondents could arrange to send their letters in in time to reach the office by the middle of the week. The four letters that appear to-day arrived only yesterday and are of such importance, that the whole paper, at the last moment has had to be recast, which may possibly cause a day's delay, but the letters were too important to be delayed till next issue.

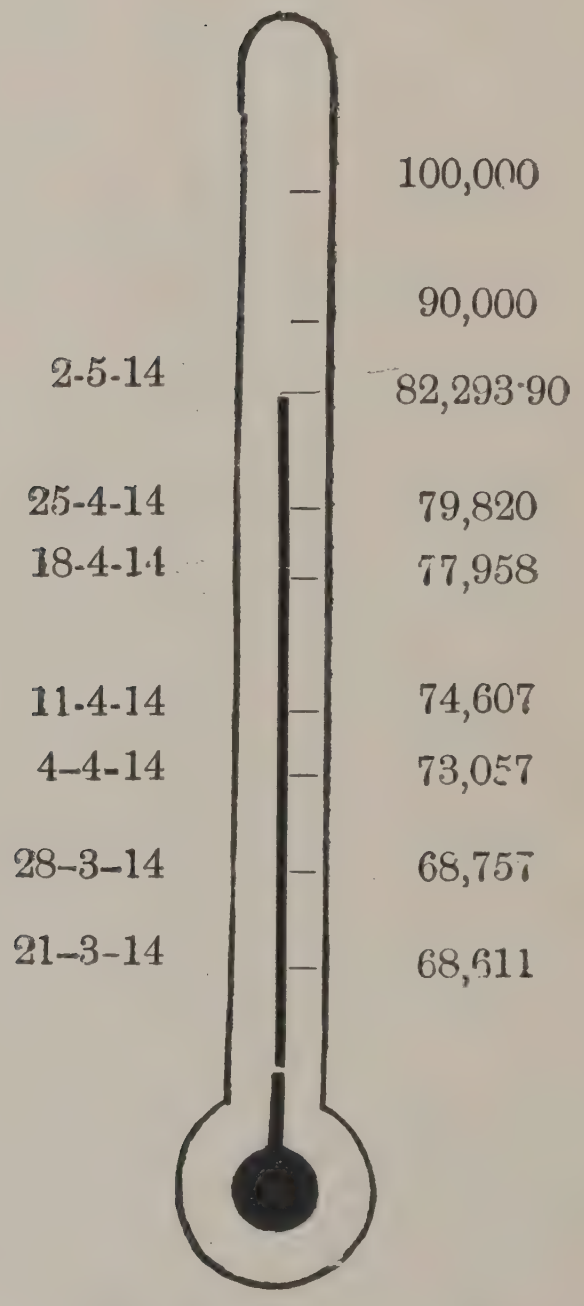
We publish the Address of the Central Travancore Planters' Association to the retiring Dewan and his reply. We hope that their Governmen will help them financially with their Ropeway.

We publish a letter from the Commonwealth of Australia with statistics of imports and exports of Coffee, and have been promised a further letter on the possible makets for it.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

CENTRAL TRAVANCORE PLANTERS' ASSOCIATION.

ADDRESS.

To

Dewan Bahadur,
P. Rajagopala Chari, M.A., B.L., C.I.E.,
Dewan of Travancore.

From

The Central Travancore Planters' Association,
Peermade.

Sir,—On behalf of the Central Travancore Planters' Association we have to thank you for paying this visit to our district when your time, on the eve of your departure, must be fully occupied with official business.

It is now close on 6 years since you took up the reins of Office and during that time the affairs of the State have been marked by steady increase and progress in every branch of the service.

His Highness by your departure loses the services of a most able and successful Minister and the general public lost a most sympathetic Dewan, and you will always be remembered by your accessibility to all castes and creeds, and for the prompt attention and sympathy with which you have dealt with any grievance brought to your notice.

Further we have to thank you as it was during your term of Office that the Planting Industry was granted a representative on His Highness' Legislative Council.

As you are aware this district has made rapid strides during the last few years and further large areas are being opened up in tea and cardamoms which means a large increase in the labour force required, and the present crops of tea and cardamoms will be more than doubled in the course of two or three years.

The question of transport has been before us for some time and has lately become very acute.

A few years ago it became necessary to divide the transport of the district between the eastern and western ghats. This relieved matters for a while, but we have again reached a stage when the traffic between Peermade and Kottayam has got quite beyond the capacity of the present methods of transport.

Owing to the large influx of labour we have several times been on the verge of famine owing to our inability to get up rice and other food stuffs to feed our coolies.

About eighteen months ago a Motor Transport Company was formed to run between Kottayam and Mundakayam which has been a great success, and has relieved matters as far as that district is concerned, but Peermade is always faced with the ghat journey which is both unpopular and fast becoming impossible for carts on account of the want of grazing and water in the dry weather.

Motor Transport on this section of the road is quite impossible owing to the steepness of the gradient and the acute curves on the road,

We have therefore had to look for some mechanical means of transport to meet our troubles and this has taken the form of an aerial Ropeway.

We have spared neither time, money or trouble on the selection of the most suitable route and in getting the best expert advice, both out here and

in England, with the result that we now have a definite scheme to lay before those interested which gives every prospect of success and a good return on the invested capital.

The cost however is considerably more than was originally anticipated and we are afraid that without outside help the scheme is beyond the limits of the Estates.

We hope that after your visit and having made enquiries on the spot you will realise what the scheme means to the district and surrounding country, and that you will therefore see fit to recommend His Highness' Government to give us some financial assistance towards the project, either by taking shares or in the form of debentures.

In conclusion we would thank you for all you have done for us during your most successful term of Statesmanship in Travancore.

We would ask you, Sir, to accept our sincere expressions of regret at your departure, and in wishing you good-bye we trust that your visit to Great Britain will be a pleasant one and strengthen, if possible the, bonds of sympathy which vou have always extended to Europeans in Travancore.

We remain, Sir,

Your most obedient Servants,

For the Central Travancore Planters' Association,

(Signed) H. C. WESTAWAY,
Chairman.

(„) R. P. ROISSIER,
Hon. Secretary.

(„) J. A. RICHARDSON,
Planting Member of Council.

Dewan's reply to the Central Travancore Planters' Association, Peermade, 30th April, 1914.

Gentlemen.—I am very glad to have this opportunity of meeting the members of the Central Travancore Planters' Associatiou and to receive their appreciation of the progress which their Distrtct has made during my term of office as Dewan, I also note with pleasure that you appreciate the appointment of one of you to His Highness the Maharajah's Legislative Council. The gentlemen who have sat on that Council as your representatives have so far done good work, and you may rest assured that, in view of the importance of your industry in this State, there will always be a Planting Member on the Council. His Highness' Government know how much of the development of these remote corners of the State is due to the introduction of European capital and enterprise. The policy of encouraging that capital and the enterprise is not a new one; it is as old as Sir T. Madhava Rao. The Government of His Highness the Maharajah have never either believed, or acted on the belief, that it would be better to leave the country wholly undeveloped than develop it with the help of foreign capital. On the other hand, large areas which are now smiling gardens would be wildernesses but for the enterprise and capital of the Europeans. We gladly recognise that a substantial portion of the material development which the State has had is due to this cause.

We are also glad, Gentlemen, that the relations between our officers and you have generally been so cordial. I particularly wish to mention here our appreciation of the frank and straightforward way in which the planters have accepted the increased burdens which the Government felt

bound to put upon them in recent years in their attempt to better the financial position of the State. When I came to this State nearly seven years ago, there were areas which were paying a nominal two anna assessment per acre; these were practically abandoned lands; the result of the lenient assessment, however, was that the holders would neither finally give up their lands nor improve them. The other Coffee and Tea lands were paying an assessment of twelve annas per acre. One of the first steps taken by me was to abolish the two anna rate and to bring those lands into line with the lands under regular cultivation. In the result, some of the lands were formally given up, but others began to be worked up. Later on, the twelve anna assessment was, in the case of *all* Coffee and Tea lands, raised to Re.1 per acre. Again taking the *tharavila*, it was ranging from Rs.10 to Rs.15 per acre when I came here. It was mostly Rs.10 per acre. I raised it at first to Rs.15 per acre, then to Rs.20 and afterwards to Rs.25 per acre. The Forest Rules are also being more rigorously worked now than they had been at any time before. And lastly, we have put tolls on your traffic both on the east as well as on the west. In all these ways your contribution to the Public Exchequer has been substantially increased, and I wish to take this opportunity to express, on behalf of His Highness' Government, our appreciation of the excellent spirit in which you took our action. The additional burdens have been cheerfully accepted, and I have not heard a murmur from any of you complaining of the substantial increase of the burden of taxation falling on you. That being so, we have felt that every consideration was due to you in the matter of the redress of your legitimate grievances, and His Highness' Government have not hesitated to incur such expenditure as was found necessary from time to time, to improve communications in the planting areas.

While on the subject of communications, I would at once say that we realise that the question of transport, so far as Peermade is concerned, is assuming an acute form. The Government recognise that the development of this district is being seriously impeded by the difficulties of transport. Cattle transport is becoming, I know, more and more difficult and costly, and it not unfrequently wholly breaks down. I see that the Motor Lorries you are running between Mundakayam and Kottayam are doing well. That being so, it should be possible to develop them. The real difficulty is, as you say, in regard to the section between Mundakayam and the plateau, and it is for this that your Ropeway scheme has been suggested. This matter came up before the Government some time ago, and while we were prepared to give you all facilities, we were not prepared to share with you in the concern. I, however, now see that the question is much more serious than I had thought, and I see that, if some energetic action is not taken to maintain and develop the traffic to the west, the tendency would be for almost the whole of that traffic to flow to the east, as a substantial portion of it has already done. Yesterday the Indian traders of Kottayam urged me to look into the whole question and to take such action as I might deem necessary to obviate what they rightly felt to be a serious risk, namely the whole diversion of the traffic to British territory. I have already talked this matter over with Mr. Richardson, and I shall certainly place it again before His Highness for consideration. I do not, however, wish for obvious reasons, to commit His Highness' Government to any definite promise just now.

In conclusion, let me assure you, Gentlemen, how gratified I feel at the thought that the relations between the Government and yourselves have been so cordial during my time; and I thank you most sincerely for your good wishes and God speed.

PRUNING TREES.

(Bailey's Cyclopædia.)

Fruit trees are pruned for the purpose of enabling them to produce a superior quality of fruit. They are not pruned primarily to assume any definite or pre-conceived shape. It is best, as a rule, to allow each variety of tree to take its own natural or normal form, only pruning it sufficiently, so far as shape is concerned, to remove any unusual or unsymmetrical growths.

1st.—The fundamental conception in the pruning of fruit trees is to reduce the struggle for existence, so that the remaining parts may produce larger and finer fruits.

2nd.—The result of pruning fruit trees should be to keep the tree in bearing condition, not to force it into condition. If the tree has received proper care from the time it is planted it should come into bearing when it reaches the age of puberty. Pruning. therefore, is merely a corrective process, and keeps the tree in proper bearing condition. When trees have been much neglected, pruning may be the means of reinvigorating them and setting them into a thriftier condition. In such cases it is one of the means of renovating the tree, as tilling, fertilising and spraying are.

3rd.—Heavy pruning of the top tends to produce wood. This is because the same amount of root energy is concentrated into a smaller amount of top, thereby causing a heavier growth. This is particularly true if the pruning is done when the plant is dormant.

4th.—Heavy pruning of the root tends to lessen the production of wood because the same amount of top receives a less supply of soil with its content of plant food.

5th.—Trees which grow much to wood are likely to be relatively unproductive. It is an old maxim that checking growth induces fruitfulness, so long as the plant remains healthy. If the tree is thrown into redundant growth every two or three years by very heavy pruning it tends to continue to produce wood at the expense of fruit. When a tree is to be brought into bearing condition by general good treatment, the aim should be to keep it in that condition by a relatively light annual pruning. Violent pruning is allowable only when trees have been neglected and is necessary to bring them back into bearing condition, or to renew their tops.

6th.—The operator should know where the fruit buds are borne before undertaking the pruning of any fruit tree, otherwise he may destroy too many of them. If he knows the position of the fruit buds he may prune in such manner as to thin the fruit even without the removal of much wood, and thereby to reduce the struggle for existence to a minimum. Every species of tree has its own method of fruit bearing.

* * *

Cacao (Cocoa or Chocolate) bears on old matured wood, and the aim with this tree is to make it grow as substantial as possible, thick trunk, three main branches, and laterals from these, arranged so as to give each branch as nearly as possible equal room so that they may grow thick and strong. The best Cacao pods are borne directly on the trunk or main branches, not on terminal twigs like oranges.

Coffee, on the other hand, bears on new wood and even with coffee there are two distinct processes of pruning. There is the pruning for what is called "short top coffee" and "long top coffee."

Shortly the system for pruning short top coffee is to prevent crowded, twiggy growth; to have laterals from the main trunk, equally spaced (as Nature fortunately tries to do of itself) and to have primary, secondary and tertiary branches evenly arranged also, so as not to have any of these growing too close to the main trunk, and so crowding it and preventing air circulating. An open space be kept near the trunk. The pruning of "long top" coffee consists simply in calculating for a constant relay of new wood every year, as conveniently planned as may be, with the view of not interfering with the neighbouring trees, and also to facilitate picking.

Citrus trees, that is, Oranges and Grape fruits, (the growth of lemons is different, but these are not grown commercially in Jamaica) bear the fruit on the terminal branches and pruning must be aimed at securing plenty of light and air circulating through the trees, with no branches or twigs crowding the inside, and to secure plenty of spreading outside growth. The sun should not be allowed to strike directly on the trunk or main branches, else the bark becomes hard and brown, hide-bound as it is called, like so many pasture grown trees, *i,e.*, instead of being greenish and succulent, it becomes hard and brown, and so the free flow of the sap is impeded. Orange and Grape fruit trees are ever-greens, not deciduous trees which drop their leaves at a certain time of the year and it is essential that their trunks should be shaded by their tops, and that their tops should present as much surface as possible to the sun.

7th.—Heading-in tends to promote fruitfulness in Citrus trees, particularly in those trees that are growing over-rapidly. If the heading-in is very severe, however, it may amount to a heavy pruning; and in that case it may set the plant into wood bearing rather than into fruit bearing or result in a crowd of gormondizers starting. It is not to be supposed, however, that heading-in is necessarily to be advised in order to make trees bear. They may bear just as well if they are never headed-in, provided they are otherwise well-pruned and cared for. Whether one shall head-in his fruit trees or not is a personal question. If the trees are growing too rapidly root pruning is often better. This is particularly necessary when trees are growing on heavy or very fertile soil and tend to overgrow. In such case cutting off the strongest leaders and inducing laterals is a good policy.

8th.—Pruning fruit trees usually resolves itself into a thorough and systematic thinning out of the weak, imperfect and interfering branches. Thereby the energy of the plant is saved, and is deflected to those parts that are capable of bearing a usual product; the sun and air are admitted; the tree becomes manageable for spraying and for picking; all the fruits have an opportunity to develop. How much or how little to thin is wholly a local question. In humid climates, much thinning may be necessary. In dry, hot climate as on the plains—but little thinning is allowable, else the branches may sun-scald.

The foregoing are among the practical purposes to be served in pruning, and it will be seen that there are various ends to attain; therefore, have an ideal towards which to work, and always have an object in view when severing branches, shoots or spars from any portion of the tree. Never by any chance lose an opportunity of picking up any points from your neighbour, but don't attempt to follow everybody's advice.—*Jamaica Agricultural Society Journal.—The Tropical Agriculturist.*

FERTILITY OF SOILS.

Solution of Plant Food.

DR. C. F. JURITZ.

I have said that unless the plant food constituents in the soils decomposed they cannot be absorbed by the plants. The main reason of this is that until they decompose they do not become soluble, and that they should become soluble is essential, seeing that plants take up their food from solution. But how does the plant foot get dissolved in the soil? First of all by the acids which the root hairs of the plants secrete. The root of plants, as far as can be ascertained, secrete carbonic acid, while many also secrete oxalic and citric acids. These act on the fine soil particles, and dissolve them in a manner that in most cases pure water could not do and so this plant food is rendered capable of absorption into the plant itself. But there is another way in which this solution is obtained, and that is quite independent of root action on the part of the plant. I referred at an early stage to the three forms of water in the soil: first, there is the free water that drains away or runs off quite easily and rapidly after flooding by rain or irrigation; next there is the capiliary water that does not run away, but moves about slowly, and only under the stronger force of capiliary attraction, and is not lost to the soil unles by evaporation from the surface, or when the plant root absorbs it; last of all there is the film water, which, by the immense power of surface tension acting on an almost infinitely thin film of water, is so tenaciously held by the tiny soil particles, with pressure, it is said equal to 10,000 times that of the atmosphere, or 150,000 lb. per square inch, that only the application of heat can break the bond. Now under this great pressure chemical re-actions may occur which are quite impossible under ordinary conditions, and so too this film water may dissolve out of those soil particles elements of plant food which would not ordinarily be dissolved out of minerals by water. These are the means by which the plant food in the soil enters into that liquid state in which alone the plant can absorb it. Once dissolved in the film water the plant food may, with comparative ease, be passed on to the capiliary water, and be thereby transported to other parts of the soil for the plants to feed on. The roots are always, as it were, sucking up this capiliary water thus charged with plant food, and as soon as the soil in the immediate vicinity of the rootlets is dried by this suction, capiliary attraction causes the water from adjacent parts of the soil to creep along to supply its place, so that there may be said to be a continuous current of capiliary water in the direction of each root hair.

As the dissolving power of the film water varies greatly according to the minerals that it acts on; and as the root hairs of different plants secrete different acids, or the same acids in different strengths, you will understand how impossible it is for the soil chemist, with one standard method of soil extraction to treat the soil in his laboratory precisely in the manner that plants act on it; all that he can do is to approximate as nearly as possible to the field conditions without ever hoping to imitate them exactly.

But in discussing the actual process of plant feeding, I have hitherto been dealing only with the mineral constituents of plant food; nitrogen is not included among these but is usually contained in the soil in two other forms, namely, as (1) organic nitrogen, in the remains of dead leaves and other parts of plants, and (2) as atmospheric nitrogen, in the air that circu-

lates through the pore spaces in the soil. The organic nitrogen is just as incapable as the mineral cilicates of becoming dissolved in the soil water, and before it can enter into the plant it has to be transformed into soluble nitrates. This transformation is effected by certain kinds of bacteria or micro-organisms in the soil. As for the atmospheric nitrogen it can be taken up only by leguminous plants, or plants which are provided with nodules or swellings on the roots, and these nodules swarm with other bacteria. In both cases, whether it be the soil bacteria that fix the organic nitrogen or the plant bacteria that utilise the atmospheric nitrogen, bacteria constitute the means of rendering nitrogen available to the plant, and the first requisite for a successful issue of course is the presence in the soil of those bacteria. In fertile soils they are in present enormous numbers, but inother soils they may be practically absent, and such soils have to be inoculated with the needed bacteria before any nitrogen fixation can go on. Next, the soil must have a free air circulation not alone that the nitrogen which leguminous crops need may be supplied to them, also because the bacteria cannot live unless certain conditions are fulfilled, and one of these conditions is a sufficiency of air in the soil. If the air supply of the soil is so dense that air cannot circulate in it, the bacteria may be said to be drowned in one case and suffocated in the other. They can as little exist in a soil that lacks moisture, as in one that has all its air spaces filled with water, and so the happy medium must be observed, and in order that the best results may be obtained, the soil may have what is called its optimum of water. There are, therefore, as you see, many factors that between them regulate that optimum.

Conditions affecting Soil Fertility.

Do not imagine that an unproductive soil always means deficiency in plant food. It may mean that and it may not. It may mean that there is abundance of plant food materials, but not just in that condition wherein plants can take it in; it may mean that there is not only plant food materials, but even plant food itself in an available condition, but that lack of aeration, brought about either by excessive density of the soil or by water-logging, is stiffling the plant's root action. Unproductiveness in soils is so often the result of cultural errors that it is unwise to seize upon lack of fertility as the fundamental cause, and yet that is exactly what most people do. It is true that there are many soils in this country that are wanting in fertility but I have quoted to you several cases of chemically good soils in which mismanagement of water supply or in perfect physical manipulation has caused the ills that have been laid at the door of the soils chemical qualifications. We cannot deal with those ills by mere random guess work, they require study, especially in a relatively young country, and as our conditions generally are so different from those of the older countries, we need fuller study of our many productive soil types, in order that they may serve as standards of comparison when we are faced with problems of unproductive soils or have to deal with cases of actual or supposed infertility.—*Agricultural Journal of the Union of South Africa.—The Tropical Agriculturist.*

A Local Labour Federation.

In regard to the question of a Local Labour Federation, the Honorary Secretary read the following letter from Mr. R. T. Thornton, Honorary Secretary of the Uda Pussellawa P. A.:—"At our last meeting it was decided that a combination of three districts such as Dimbulla, Badulla and Uda Pussellawa was undesirable, even if all the districts agreed to join, as it tends to restrict the freedom of the cooly."—*Weekly Times of Ceylon.*

DECOMPOSITION OF MINERALS.

Soil Chemistry.

It is not enough, however, that the mineral constituents which go to form plant food should be merely mechanically disintegrated, they also need to be chemically decomposed. By this I mean that the rocks of which soils are made must not only become a fine powder before plants can make use of what they contain, but the very substances of which those rocks consist must undergo an internal change. There are, as you see, two separate branches of science involved ; soil physics is concerned in the investigation of the mechanical condition of the soil, and soil chemistry in that of its chemical condition ; and the one science cannot say to the other, "I have no need of thee". In the Vine Diseases Commissions Report, issued in 1881, the results of analyses of a number of granite soils from Constantia, performed by Professor Hahn, were tabulated. In many cases it was found that the vines were poor and sickly, having evidently been badly nourished although the granite rocks, from which the soil whereon they stood had been derived, to all appearances contained ample quantities of lime, potash, and phosphoric oxide. On other soils, derived from that identical granite, the vine yards were healthy and thriving, In both cases there were ample supplies of the materials of plant food in the soil, but in the one case the granite had been nearly disintegrated, and in the other it had been thoroughly decomposed as well. That means to say that in the former case the plant food materials were there, but not in the condition available for the plants. In the latter case, not only were the plant food materials there, but they had been converted into actual plant food, by thorough decomposition of the granite. The result was that the soil on which the vine yards flourished contained 8 times as much available lime, 6 times as much available potash and 12 times as much available phosphoric oxide as the average of the remaining soils. This one soil was particularly good granite alluvium. In another of these Constantia soils there was no available lime whatever, simply because the felspar which would have supplied it had not been decomposed.

From this you observe that it is not enough for a soil merely to contain lime and potash ; these may be there in so coarse a condition that the plant roots can do nothing with them. And even if they are in the soil as a more or less fine powder, they may be present only as sillicates, and in that state they cannot get dissolved, and so the plants fail to absorb them, because it is necessary for plant food to enter into solution before the plants can take it up.

It is therefore very essential to the fertility of the soil that it should contain its plant food materials in such a form that they may be available to the plant. If they are not available they might just as well not be there at all, and so, in chemical soil analyses, the availability or non-availability of the plant food materials present is an all-important matter for consideration. There has often been an outcry against soil analyses by people who did not know what they were tilting at. Methods of analyses which involve fusion or disclosing of the silicates in the soil may be interesting to the geologist, but for the practical agriculturist they have little value. It is as useless to tell a farmer that the total percentage of potash, lime, or magnesia in his soil is so and so much, as it would be to make him a free gift of all the gold that lies in the wrecked *Titanic*, four miles below the surface of the Atlantic Ocean. Both are useless because non-available. But, apart from this, the availability of plant food in soils is tested by different methods. Some investigators take strong boiling acids, and subject the soils to their action for few minutes only. Others take cold acids and leave them on the

soils for days. Others again use almost the weakest acids they can find, and use them in the cold. Naturally the results that you get from one and the same soils by such vastly different methods of analyses must differ very much from each other. These different methods are being used in different parts of this Union, and so farmers have come to me in perplexity with seemingly contradictory figures, and have asked me how they can be reconciled. Professor HILGARD of California, one of the most renowned soil investigators in the world, in his treatise on "SOILS" expressed his deep regreat that in various parts of the world methods of soil analyses were being used which were so incommensurable that it was quite impossible ever to compare agriculturally the soils of the various countries as to their chemical nature, and, writing to me on the subject about three years ago (7th May, 1910) he said :—

"I am greatly pleased that you have adopted my method of soil extraction for your work. I believe it to be the one most likely to find general acceptance, as having a natural element not subject to arbitrary personal bias. I have given the method a long trial, and find that results can be successfully interpreted, but I regret more and more the amount of energy wasted upon arbitrarily fixed methods, which are unlikely ever to receive universal assent."

At the International Agrogeological Congress at Budapesth in April 1909, a report by the same eminent authority on "The Unification of Chemical Soil Analyses" was read, in which he pleaded earnestly for uniformity the world over ; with us in South Africa diversity is excused on the plea that independence of operators gives the best results.—DR. CHAS. F. JURITZ in *South Africa Agric. Journal.—The Tropical Agriculturist.*

REPORT ON THE TRADE OF THE CONGO FOR THE YEAR 1912.

By Mr. Vice-Consul J. E. BELL.

General Remarks.—During the period of this report a grave economic crisis arose for the Belgian Congo, due to the great fall in the price of rubber. The staple raw product of the Congo hitherto has been rubber, the percentage of rubber to the total volume of exports for the year 1910 being 76·9 per cent. and for the year 1911 63·9 per cent. The margin of profit to the exporter of forest rubber from the Congo—even with the ameliorative reductions in freight and duty granted by the railway company and the Government—has now disappeared under the pressure of competition from plantation rubber. If the present low prices in Europe continue the consequences will prove very disastrous to the future of the Congo, unless some other product equally valuable is found to take the place of wild rubber. Much is hoped from the palm-oil industry, which is being almost entirely exploited by British Capital, and from gum copal. Valuable minerals deposits have also been reported from time to time, but difficulties of transport present a serious obstacle. Up to the present, however, rubber has been the chief product of this country and taxes direct and indirect on rubber are the chief source of revenue for the Government, consequently the situation is grave indeed. It can only be said at this juncture that the future is full of uncertainty, and it is exceedingly difficult to predict the ultimate outcome.

Trade and Commerce.—The statistics for the year 1912 show an increase in total imports and exports over the year 1911 of 10,000,000 fr. (400,0001.), but during that year the effects of the rubber crisis had not become perceptible.—*Diplomatic and Consular Report*, Congo Annual Series 5260.

NITRIC ACID AND AMMONIA.

Bacteria are the agents at work in increasing the supply of nitrogen, forming nitric acid in the soil, leguminous plants being especially adapted for the purpose. The discovery of the use of bacteria for inoculating soils has been given considerable attention, but the combinations of nitric acid or ammonia are not generally understood by all farmers. Nitric acid differs from ammonia in containing one atom of hydrogen and three of oxygen; ammonia containing three atoms of hydrogen but no oxygen at all, the acid and the ammonia also containing each one atom of nitrogen. In the atmosphere the oxygen and nitrogen are not combined, existing in a free condition. That is, each atom of oxygen is separate from the atoms of nitrogen, and has no connection with them except being in their company, but the atom of nitrogen in a particle of ammonia is chemically combined to the three atoms of hydrogen, the four atoms thus combined forming one particle of ammonia, the atoms being thus combined while the particle is free. Nitrogen forms ammonia in the manure heap only at the moment of liberation from other substances, but not when the atoms of hydrogen and nitrogen are brought together in the air. To make it plainer, it may be stated that nitrogen that is combined, as it is in decomposing materials, will recombine to form other substances, but when once it is liberated from combination, and escapes in the uncombined condition, it is lost and mingles in a free condition with the atmosphere. The plentiful nitrogen, therefore, is a substance composing four-fifths of our atmosphere, that substance being one of the most valuable ingredients of plant food, yet the most eminent agriculturists and chemists have been powerless until now to devise any method by which we can utilise it while in its free condition in the atmosphere, and yet, with the high prices paid for nitrate, guano, and other nitrogenous materials, we get but a small proportion of nitrogen in them. A ton of pure nitrogen would be valued at about £60, and sometimes it is paid for in that proportion, though at every breath we inhale it in large quantity. In the atmosphere is a small percentage of carbon, but this proportion produces our forests and enters into the composition of all plants. Such being the case, the 80 per cent., if nitrogen should be appropriated cheaply from the air, like carbon, would enable us to grow the most luxuriant crops, and in the near future inventors may solve the problem of combining it with but little cost, when bread will be produced cheaply, for the crops will be doubled and quadrupled on every farm. *There is estimating what is in store for the coming* farmer, for, with additional discoveries of phosphate, rock and potash, with nitrogen as cheap as lime, and labour-saving agricultural machinery used in all departments of the farm, everything should be plentiful.—*Mark Lane Express Agricultural Journal.*

Labour in Malaya.

* * *

Companies have to produce their rubber at a profit, which they cannot do at present prices, if rates of pay are raised. Consequently, if labour is insufficient, other inducements have to be held out to attract it. Unless the situation is brought under control by a proper organisation, the inducement which in many cases will be offered is that of higher advances, as was the case in Ceylon in the tea boom. Though this course would be fatal, it can be adopted without raising the suspicions of inexperienced shareholders, because coolie advances are not charged in the yearly profit and loss account, although they are never likely to be recovered, but appear as an asset in the balance sheet, and consequently do not raise the cost of production.—*Grenier's Rubber News.*

CORRESPONDENCE.

Coffee.

Commonwealth of Australia.

Department of External Affairs.

Melbourne, 16th April, 1914.

Sir,—With reference to your letter addressed to the Minister for Trade and Customs, respecting the propects in regard to the export of coffee to Australia, I have the honour, by direction, to forward for your information the attached returns, which it is hoped will be of assistance to you in connection with this matter.

2. Inquiries are being made concerning the question of markets for coffee in the Commonwealth, and a further communication on the subject will be addressed to you at a later date.

I have the honour to be,
Sir,
Your obedient Servant,

A. HUNT.
Secretary,

Fletcher Norton, Esq.,
Secretary,
United Planters' Association of Southern India,
25, South Parade,
Bangalore, India.

Commonwealth of Australia.

IMPORTS AND EXPORTS OF COFFEE 1909 TO 1912.

Coffee—Raw or Kiln-dried.

	Imports.		Exports.	
	lbs.	£.	lbs.	£.
1909 ...	1,970,760	55,360	81,893	2,691
1910 ...	2,213,083	60,950	115,576	3,758
1911 ...	2,014,712	66,257	127,096	4,518
1912 ...	2,431,466	89,791	88,858	3,506

Coffee and Chicory, Roasted or ground, and in liquid form.

	Imports.		Exports.	
	lbs.	£.	lbs.	£.
1909 ...	292,946	15,526	23,775	1,127
1910 ...	319,306	17,573	23,826	1,301
1911 ...	383,360	20,465	22,072	1,245
1912 ...	534,540	27,383	24,932	1,476

The Commonwealth Government offer a Bounty of 1*d.* per lb. on Raw Coffee. The amount of Raw Coffee produced on which Bounty was paid during the past five years is:—

Year ended 30th June.	lbs.
1908	2,111
1909	53,365
1910	28,134
1911	26,645
1912	16,269

CONSUMPTION.

The local production being small, the average consumption may be fairly assumed to be the difference between the Imports and the Exports.

COUNTRIES OF SUPPLY.

The subjoined table of Imports in 1912 according to Country of Origin will show the principal countries of supply :--

Country of Origin.	Coffee—Raw and Kiln-dried.		Coffee or Chicory, Roasted or Ground, and in liquid from.	
	lbs.	£.	lbs.	£.
India	1,293,709	47,541	...	...
Ceylon	12,701	490	...	...
West Indies	152,269	5,172	...	...
Abysinnia	13,440	570	...	...
Arabia	140,399	5,670	...	...
Brazil	48,990	1,802	...	...
Costa Rica	59,230	2,300	...	...
Java	605,818	22,130	23,072	829
Guatemala	51,393	2,115	...	...
Hawaiian Islands ...	10,000	399	...	...
Venezuela	8,312	329	...	...
U. S. America	4,480	156	...	...
United Kingdom ...	...	...	502,727	26,094
Straits Settlement ...	...	...	2,643	212
Other countries ...	30,725	1,117	6,098	248
Total ...	2,431466	89,791	534,540	27,383

Note.—The value for statistical purposes is taken to be the fair market value in the principal markets of the country whence the goods were exported, with an addition of 10% to such market value.

PRICES.

The average wholesale price for Ground Coffee during 1912 is stated to be 1/2½ per lb., and in 1913 1/3 per lb.

"Woodlands,"
Kullakamby, The Nilgiris,
13th May, 1914.

Labour Department.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Sir,

I have read with much interest Mr. Mead's letter in your issue of the 2nd instant. I am directly responsible for this letter, for I urged Mr. Mead to write, but I must own that his assistance, valuable as his contribution is, has not taken the form that I anticipated it would after our conversation.

His letter is, so to speak, the second chapter on the subject, so I take the liberty of asking you to publish a letter which I wrote to Mr. Mead on the 20th ultimo, or 6 days prior to his letter to yourself.

For a proper understanding of what passed between Mr. Mead and myself it is quite necessary that my letter should be read with his.

I think any one who is in favour of the Labour Department will welcome this letter of Mr. Mead. It is known that in certain quarters the scheme has received but half hearted support, and also that in other quarters there is distinct opposition to it.

Any one reading the proceedings of meetings might be led to believe otherwise, for it is quite true that this opposition has never been openly expressed. The critics of the scheme, since it reached its present form have not come forward with any definite criticism in print or discussion that could be taken hold of and dealt with in a satisfactory manner. I should like to think that this is because the case for the Department is so overwhelmingly strong, and perhaps this is so,

PREFERENTIAL RECRUITING AREAS.—To the extent, which Mr. Mead has read a different meaning into my words than what I intended, Preferential Recruiting Areas are impossible. If I could bring myself to believe that Mr. Mead has laboured this point with the sole view of driving a wedge between Tea planters and Coffee planters, and so wrecking the scheme, I would feel bound to write at even greater length, as it is I think the point is fairly dealt with in my letter of the 20th April.

I will add that I think any fair minded man will agree with me, that if the shortage of labour be admitted, the necessity of economy in using that labour must be admitted also. It is an economy that is practised with the other important things of life, why not with labour also?

It is not an economy to recruit coolies for a district that is unsuited for them, where perhaps never more than 80 per cent. of a gang turn out for work, and where at the end of their agreement 50% of the coolies have to be carried away by their slightly more robust friends. Surely a Labour Department, well backed by acreage and money, should be able, in time, to stop a wastage of this sort. Mr. Mead has gone further on this point than the arguments adduced warrant. He deduces that a combined Labour Department will stimulate the game of cut throat, whereas it will be called into existence to check that game.

Consider for a moment the causes and effects of the present labour difficulties.

The demand must exceed the present supply or there would not be a shortage.

For years Travancore have got on with their own recruiting grounds, and now apparently they are turning their eyes on the recruiting grounds of Mysore and Coorg. The reason for this is that overseas competition is depleting their resources. If the Labour Department can do anything to check this depletion, even in one recruiting district, surely the strain will be relieved to some extent in the other districts.

POSITION OF NON-SUBSCRIBING ESTATES.—Here Mr. Mead has taken his stand on high moral ground that may be quite impregnable. Mr. Mead is not trying to drive a wedge between the Tea Planter and Coffee Planter, but his whole letter breathes a touching solicitude for the welfare of Coorg and Mysore which does him credit, and certainly he seems to urge a *rapprochement*, or even an alliance, between the Rubber Planter and the Coffee Planter for their mutual benefit. I for one will not oppose this gospel, it is a step in the right direction, but only one step. I merely plead for a second step, the inclusion of the Tea Planter.

Mr. Mead is against this. In his letter Wynaad is particularly excluded from this alliance, though he admits the interest of Wynaad in West Cost Labour, in another paragraph.

If this half loaf gospel is put forward in all seriousness, in all seriousness it should be considered, but men are suspicious and to allay their suspicions I would ask its evangelist to tell us about the few hundreds of Tulu coolies which he employs and how he came to employ them.

Were these maistries and coolies bright new coins freshly brought into currency or had they previously worked on other estates?

If they had worked on other estates, how were they got hold of? Is it possible that they were tampered with, not by Mr, Mead of course, but by any agent? Is it possible that the men who employed these coolies previous to their going to Mr, Mead expected them to come back the following year and lost heavily because they did not come back? Is it even possible that some of those maistries and coolies had been readvanced, and that a direct money loss was incurred on them? Is it not probable, if two rubber estates unwisely advanced the same maistry that there was even a third advance lost by Mysore or Coorg?

Proved and convincing answers to these question by Mr. Mead, not only would go a long way to cement the alliance he suggests, but also would support his contention that the Labour Department would be morally outside the pale in trying to induce an unadvanced maistry to take his coolies to a subscribing estate.

The Department will be able to advertise the attractions of a subscribing estate as Mr. Mead says, and I hope that it may be run so well that it will be only a matter of time before the honest kangany and maistry, recognising the value of its support, will prefer. to work on a subscribing estate rather than on a non-subscribing estate.

RATES OF PAY.—Mr. Mead has quoted me again and I must refer you to my letter. I have this to add. I think too much is made of rates of pay. The matter in its true aspect is beyond our control. If the cost of living goes up the rate of wage will go up too, and the ultimate result will be an increase in the cost of the article produced to the consumer. It may be unpleasant, but it is inevitable. There are however two side points which need consideration. The first is to secure money's worth for the wage paid. This can only be done by improved discipline among coolies and maistries, which I agree with Mr. Mead is one of the advantages that should be secured by the Labour Department. It will prove cheaper to get sixpennorth of work for six pence than threepennorth for four pence. The second point is the competitive raising of rates, and with this I include the raising of advances for the same reason, No advantage accrues to the industry, if a man raise his rate of pay behind his neighbours' back, so as to secure a temporary advantage.

Is is evident that Mr. Mead is giving the matter much thought, and it is equally evident that he has not come, as yet, to any definite conclusion for it is impossible to reconcile his admission that he thought those in favor of the Department had got hold of the right end of the stick, and his suggestion that he should join the Department with part of his acreage, with what he has written, such a few days after our conversation.

Yours faithfully,

E. F. BARBER.

POST SCRIPT.—Since writing the above I have had authentic information that the West Coast cooly is being exploited by the overseas recruiter to an extent I was not previously aware of.

Ootacamund,
20th April, 1914.

[INCLOSURE.]

My dear Mead,—I am glad to have had a talk with you on the Labour Scheme.

PREFERENTIAL TREATMENT—It will be quite impossible to reserve any recruiting ground for any particular district and I think Coorg and Mysore realise this. They have lost coolies to the South and I fancy they lost a lot of them unfairly. Some of the Tamil districts are riddled with unfair recruiting, but I think if the Labour Department is started soon S. Canara can be saved from abuses that are prevalent elsewhere. If the Tulus are satisfactory in Mundakayam they will be equally suitable in Ceylon and the Straits, and it will be only a matter of time before the professional comes along and makes Mangalore as bad as Salem and Erode are now. If the Department does its work properly it will try and see that what coolies are in currency now are used as economically as possible, and it will also try and bring more coolies into currency to make up any shortage there may be.

At present I think there must be a considerable wastage of coolies. I know of estates employing a class of coolies that are quite unsuited to the district, the result is bad health, poor out-turn, and a bad advertisement for estate work. If actual restriction were agreed upon it would, I imagine, lead to an attempt at restriction of wages and then I fancy the whole show would be bust up, for it would be dealing with an economical matter that no power on earth can touch with safety, The Labour Department will not be able to restrict the rates of pay which have other reasons than competition for going up, but it should be able to prevent a competitive rise of wages due solely to the cut throat game played by employers, which is quite as unsound as trying to keep wages below their proper level. Besides preventing a competitive rise in wages it should also prevent a rise in advances.

You made a good point when you said that we were in a worse position as regards advances than Ceylon. This is quite true, for hitherto a labour force in Ceylon has always been a saleable asset at nearly its full cost, whereas with us, any advance not recovered within a year may be looked upon as bad.

I think even on these points only the Labour Department is necessary and, if run properly, should prove of value, even to those who have no labour difficulties at present.

RETALIATION.—Will the Labour Department be actively hostile to those that remain outside? This is a question that needs much thought. I think that the restriction of rotten competition between districts and individuals is one of the reasons that a Labour Department is necessary. If this is so it must be taken that those who remain outside, provided of course that they are getting coolies from recognised recruiting areas, are competitors who must be dealt with according to the way in which they compete. If those who remained outside benefited by the restricted competition equally with those who paid their Rs. 2 per acre to attain this end, it would be manifestly unfair. I think the Department should do all in its power by advertisement and direct propaganda to induce coolies to go to subscribing estates and incidentally, provided the subscribing estates are not full up with labour, to prevent them going elsewhere. This is only business and is what Ceylon and K. D. are doing with more or less success. To this extent then the answer is "Yes, those who are not with us are against us." Ceylon are in this lot and will remain there until we are strongly

enough backed with money and acreage to invite them to come to a working arrangement with us. This would be the second step in the settlement of the labour question and I hope it will come.

If however you are asking if the Department will use unfair means to keep labour from non-subscribing estates my personal answer is a most emphatic "No." Of course the word unfair needs careful definition, but as I take it now it means crimping, inducing labour under agreement to leave an estate. As I see it one of the objects of the Department is to reintroduce discipline among kanganies and coolies. In some districts it is certain that the discipline is getting worse year by year and I believe this is in a great measure due to irregular recruiting. Coolies have found out that they can take advances from more than one kangany, it may be difficult but it is done, and they know with the present weakening of the Kangany system that they can play one kangany off against another. The result of this is that the good kangany, the man who could work his labour, is disappearing. The kangany is afraid of his cooly where his cooly used to be afraid of him. What is said about cooly and kangany is almost equally true as regards kangany and employer and as far as I can see the cost of work is increasing more rapidly than the rate of wages.

If the Department lends a dirty hand in helping to advance labour that is already advanced, it will be intensifying what it was brought into existence to suppress, and I think that those who are opposed to the scheme may feel happy, that in doing it, it will bring about its own destruction.

There will be bad eggs inside the pale as well as outside, and if the Department can make them uncomfortable, it will be fulfilling part of its duty.

I do not think the Department will be entitled to afford any direct help whatever to those who do not subscribe, but it may do so incidentally in helping a subscriber.

ACREAGE AND SUBSCRIPTION.—I think only under certain circumstances could part of an acreage subscribe. A man might hold two estates under totally different conditions. I think he would be entitled to subscribe for one and not the other.

Again the two estates might be under similar conditions, but different managers, one manager might want the department and the other not. Here again I don't think it is a case of both or neither. But in your case as regards Mooply I do think it should be all or nothing. I can quite see that you may not want the Department to the extent others do, but if we conceded this we should also have to concede preferential treatment in other respects and this has been found impossible.

The cost when lumped looks high, but it is not going to affect either your capital or revenue expenditure as regards dividends to the extent of a pie—Rs. 450 per acre or Rs. 460 per acre, what does it matter, any more than it matters if your production is worth Rs. 300 per acre or Rs. 298? In some cases the Department may not be as useful as in others, but, average it right through, and given a good backing in acres and rupees, I believe it will eventually save more money than it spends.

I have written this for my own benefit, just to crystalise our talk. I shall be very glad if you can get behind your pen and push into print again.

I am sure you can help it along, even though you may not put in your acreage. If we have got hold of the right end of the stick in trying to get an organization to control our relation with labour, it is not on the score of expense that the scheme should fail.

Yours sincerely,

E. F. BARBER.

A. H. Mead. Esq.,
"White Lodge,"
Coonoor.

THE EDITOR,
Planters' Chronicle.

Sir.—Mr. Mead's letter on the *Pros.* and *Cons.* of the Labour Commission is most interesting and his solicitude on behalf of Mysore and Coorg most touching and will no doubt be taken at its proper value.

He is careful to point out that it is not the Rubber Planter Mysore and Coorg have to fear but the Tea Planter.

To my certain knowledge as far as Travancore and Cochin are concerned it is the Rubber Planters that have drawn away a certain amount of South Canara labour and have thereby brought down the wrath of Mysore and Coorg on their heads.

The Rubber Associations of Travancore and Cochin have held aloof from the Commission and it is no doubt here that the shoe pinches, and is very clearly proved by Mr. Mead's anxiety as to what treatment those who stand out will receive from the Department.

In the early stages of the proposed Commission Mr. Mead wrote a long letter to the *Chronicle* giving his views and a certain amount of correspondence then took place. Our late Chairman expressed the hope that Mr. Mead would attend the U. P. A. Meeting as we wanted criticism and discussion.

Mr. Mead did not avail himself of the opportunity however, but his Association was represented by Mr. Waddington who was most enthusiastic and whose experience was of great service to the Committee then appointed to draw up a rough outline of the scheme.

The scheme was then referred back to the local Associations with a view to holding an Extraordinary General Meeting of the U. P. A. to discuss the final arrangements but we heard nothing further from Mr. Mead.

One large Rubber Association in Travancore stood out from the first and most emphatically refused to send a Delegate to the special meeting held last March, and there the matter should have ended as far as that Association and Mr. Mead were concerned.

To attack the scheme now as Mr. Mead has done I think not only unfair but malicious after the opportunities given him of participating in the early stages of the scheme.

He poses as the friend of Mysore and Coorg and warns them that they are going into the scheme under a misunderstanding, and he now proposes a rival department of his own to put yet one more competitor in the field.

He quotes from the minutes of the Peermade Association and strongly recommends us to try South Canara labour as being most suitable for our needs.

He certainly warns Mysore and Coorg against the tea planter and possibly Mr. Mead proposes to try this labour on his own property in Peer-

made, but I must admit his statements appear rather contradictory, and it seems to me he has rushed into print without giving the matter his usual care and consideration, and it certainly does not coincide with his anxiety for the protection of Mysore and Coorg.

RESERVATION OF RECRUITING AREAS FOR CERTAIN DISTRICTS.—Mr. Mead infers this was promised by the Hon'ble Mr. Barber in his speech at the Nilgiri Meeting and that the point was evaded at the special U. P. A. Meeting held in March.

I think it was quite apparent to all at Bangalore that certain labour centres could not be exclusively reserved for particular districts, but the Labour Department will certainly prevent labour taking advances from one district and then absconding under a second advance to another.

Through the Labour Department Mysore and Coorg will most probably recover a good deal of the labour which has left them in recent years especially as they have increased their rates of pay.

There will no doubt be competition but better have it amongst ourselves under the control of *our* Labour Department than have several petty agencies all fighting amongst themselves. They would never command the consideration or respect one large combined body would do. To quote from Mr. Mead's own letter " A Commission is stronger the larger its acreage."

POSITION OF NON-SUBSCRIBING ESTATES.—As regards this I can only give my own experience which I am sure will be the same as that of the Labour Department to a much more marked degree.

For some years now I have run a Labour Agency which started for some four Estates,

I was surrounded with neighbours with whose labour I had no wish to interfere and my instructions to my Agent were to this effect.

In spite of all we could do we were continuously worried by kanganies and coolies of other estates coming to the agency wishing to be taken on chiefly because they recognised the advantages they received by working on Estates under the agency. My agency now works for twelve estates in the district, which have all come in of their own accord, chiefly at the request of their kanganies and coolies. In exactly the same way estates joining the Labour Department will have an advantage over non-subscribers.

The position of the Labour Department of course will be very different to my private agency.

Everyone has been asked to join and if they stand out that is their fault. It will not pay any of our depôts to recommend labour heavily indebted even to non-subscribers, and any attempt at this sort of thing would be promptly put down, but that we will gradually draw labour to our estates is absolutely certain, otherwise why go to all the expense and trouble.

We now come to Mr. Mead's one valid objection as far as I can see from his letter and that is the cost, and as far as his own and Mundakayam districts are concerned, I have a certain amount of sympathy with them. At the moment they are well supplied with labour, but as I have said before, how long will it last?

Whether the Department starts with 80 or 100,000 acres cannot affect Mr. Mead as he has decided to stand out, but I quite agree with him " that a Commission is stronger the larger its acreage " and while he admits this I cannot understand his proposal to start an opposition scheme and thus defeat his own argument.

He then goes on to ask himself if the K. D. H. P. Commission and my own agency are necessary to the rest of South India and agrees with himself that they are not. I can only refer him to his own argument quoted above.

In conclusion I must apologise for taking up so much of your space but I like fair play and I do not think Mr. Mead has played the game in this matter.

Had he come to the Bangalore Meeting we should have welcomed him and gladly listened to his views, but at this stage it seems rather unfair to attack the scheme as he has done.

The sum total of his letter is that he objects to the cost and decided to stand out so there let it rest. Why should he try to upset the camp of the majority which he declines to join. His solicitude for the welfare of Mysore and Coorg will not hold water by his own showing, and to me his letter seems a mass of contradictions.

Yours faithfully,

J. A. RICHARDSON.

Cathcart House,
Bangalore, 13--5—1914.

Tellicherry, May 13, 1914.

The Pros. & Cons. of the Labour Commission.

THE EDITOR,
Planters' Chronicle.

Owing to my movements lately, I have only just seen your issue of the 2nd inst., and I read with regret what I can only describe as Mr. Mead's wrecking letter.

It was generally hoped that the Commission would be allowed to go through or fail on its merits, and that it would be free at the eleventh hour from hostile criticisms; and I now view with some apprehension the possible effect on waverers of Mr Mead's facility and force of expression. There are many barbed points embedded in this letter which will encourage waverers to waver still further, and will supply the hostile with weapons; and I do hope that those capable of entering the lists against Mr. Mead will do so without delay, for though I am rushing into print it is chiefly to appeal to such to buckle on their armour and enter the fray—being myself even less capable than usual, owing to recent illness, of adequately fighting for the cause.

Mr. Mead has summed up fairly enough the Pros, and these need not detain us.

As regards the Cons, there is no doubt that the chief one is the cost; but I think that if we approach the matter with a broad view, take past experience as a guide, listen to the wise advice of our more prominent men here, and give the scheme whole-hearted support, we shall find that this will not prove excessive for the benefits to be attained; and again I ask my brother planters to *look ahead*, and picture themselves battling with the forces of anarchy and chaos which will have been let loose in three or four years' time, should a policy of masterly supineness have been followed till then.

As an alternative to this, Mr. Mead proposes his "old heresy" the District Commission, and adduces in its favour the two-fold advantages of not paying at all for others' difficulties, and less for our own. Now, as regards cost, we have been informed by more than one that small Commissions cost more than large ones; and an old adage says that "Unity is Strength." The Ceylon people and others seem to recognise this last fact

when discussing our scheme—but Mr. Mead proposes that we should divide and be conquered. Neither with our overseas competitors nor with the Government will parochial institutions have the same weight as a United Department; and divided and rival Commissions will not be able to do much more with absconding defaulters than individuals can. We may exclude certain districts from our Commission, but we cannot prevent them trying to attract our labour, and this can be done without the Expensive Commission Mr. Mead thinks would be necessary; and crimping and dishonesty would ramp as before, and the law will not aid us. An Expensive Commission is necessary to keep people straight—it requires very little to teach them to default.

To me, one of the greatest advantages of a combined Commission is the probability of our being able to discipline our labour into honest action by a united front—and if subscribers all act in an honourable and straightforward way it should be easy of attainment.

Now let us follow Mr. Mead's proposal to its logical conclusion. Exclude Tamil-employing districts, he says—why should we pay for them? I know many who will then say, "Exclude Travancore and Wynaad—why should Mysore and Coorg help them to secure the labour that was once exclusively the latter's?" This proposal has already been made, and if Mr. Mead's "heresy" takes hold it will again come to the fore. Later on, many who can see no immediate advantage to themselves in any Commission, will say "Why pay to help any one? We have lost no money for years, possibly never will, why pay out at all?" and here we are back again where we started.

I have endeavoured to take a broad view of this Commission Scheme. I have joined, not from immediate necessity, nor even from any apprehension of necessity in the near future, but from a conviction that the scheme will work to my great advantage eventually by preventing the evil I forsee if we remain supine; and if the United Commission be wrecked, I feel that little can be done for our benefit—and while I might not refuse to join a local Commissisin for Coorg and Mysore, excluding Travancore and Wynaad, I should feel that the money subscribed would be in all probability wasted, and the real benefit of a Labour Department thrown away.

I would ask all who have joined to stand fast; I appeal to waverers to waver no longer; I trust Mr. Mead will think again he is strong enough not to be afraid of changing his opinions. The eyes of the whole planting world are on us, and we have general approval of the scheme, even from those who are likely to lose from it. The eyes of the Government are also on us—sympathetically hoping for the successful launching of our enterprise, more personally interested in the probability of less work for themselves through its success, as Mr. Innes' remarks on the working of Act I will testify. Unity will be our strength, and will carry us farther than Act I, Extradition, or and legislative Enactment: let no Jack o'Lantern light lead us astray, however cleverly danced before us. United we have a chance of standing—divided we shall be little, if *any*, better off than we are now. Having got so far, it would make the angels weep to see us fall back into small groups, then split up into individuals, excluding Travancore, excluding Wynsad, excluding every one else, and the devil taking the hind most.

Yours faithfully,

C. DANVERS.

P.S.—I have made no reference to the control of the Commission, as I consider that Mr. Martin disposed of that point incontrovertibly at the extraordinary Meeting.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

Since the last appearance of the Labour Barometer only 557·51 acres have been added to it, bringing the total up to 32,251·41 acres. We would again remind supporters of the scheme who are still delaying to put their acreages on, to do so at once, as only five weeks remain in which to send the mercury up to the desired figure.

We have only just been told by an eye witness of the emigration of gangs of West Coast coolies to Assam. These coolies will be well treated and properly looked after in a sanitary way, and it must be borne in mind that each and every returning coolie is a cheap and effective advertising medium from a foreign country. The West Coast will become the happy hunting ground of every overseas agency, and recruiters honest and fraudulent. Every village on the road between Madras and Bangalore is plastered with notices from Ceylon and the Straits. The notices of the planters of Southern India are conspicuous by their absence. We believe that the *Deus ex machina*, that is dragging the necessity of a Labour Department to view, is now the Planting Monster. These visible evidences are working in its favour, but our fear is that it is working too slowly; and we quote the words of the Indian Delegates to the Extraordinary General Meeting, "And we wish you to appeal again to the men of this District (i. e. every District) who are "sitting on the fence" to join hands with those who are bearing the brunt of the struggle on behalf of the whole planting industry of Southern India."

The articles in this week's issue deal with Nitrolim, Green Dressings, Coolies, Pests and Malaria. This last subject is exercising the minds of scientists the world over, and we are told that the health of the Labour of the Straits—coolies from Southern India—is so studied that every coolie is provided with a mosquito net to ward off, as far as possible, the evil effects of the bites of anopheles.

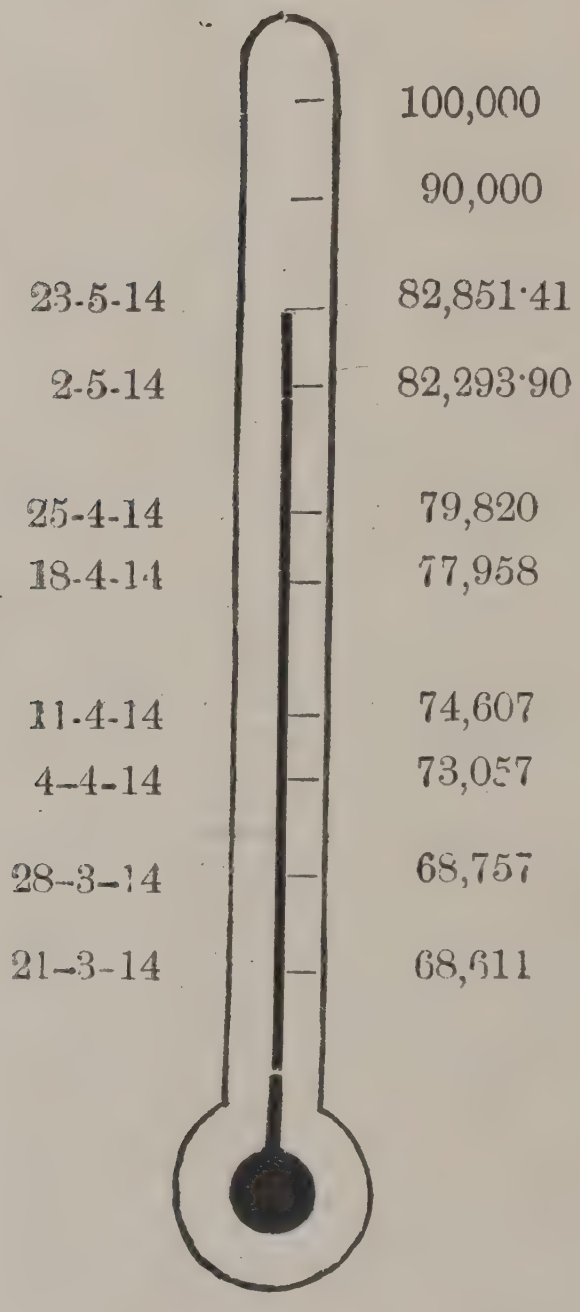
Though we have no ambition to become an arctic explorer we have the pleasure to publish a letter from Mr. Martin.

Mr. ——'s letter we hope will attract the notice of Mr. Berrie and bring forth a reply.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

NITROLIM.

The use of artificial manures enables the gardener to grow heavier crops than may be grown with the aid of animal manure alone. This has been known from time immemorial. In the Roman period B. C. 55 to A. D. 410, the Britons used dung, wood ashes, lime, marl and chalk; then agriculture flourished—Britain was the granary of the Romans and "staff" of the Roman Empire. The Anglo-Saxons and Danes, 410 to 1066, relied chiefly on marls. In the Norman and Plantagenet periods, 1066 to 1399, agriculture used marls, chalk and dung, with recourse to bare fallows. The Houses of Lancaster and York 1399 to 1485 reverted to pasture, wool being the most important item produced on the farm, and marl, chalk, and dung were the chief substances applied to restore the soil fertility. Under the House of Tudor, 1485 to 1603, the agriculturist and horticulturist woke up. They used, in addition to dung and lime, salt, fish refuse, street sweepings, malt dust and vegetable ashes, even going so far as to employ coal dust and coal ashes, as well as sand. This period was marked by a great improvement in farming and gardening, a return being made to a rotation of crops. Clover was introduced and the cultivation of Potatoes became a part of husbandry.

The House of Stuart, the Commonwealth and Restoration, 1603 to 1714 were chiefly notable, from the point of view of the cultivation of the land, for reliance on stable or farmyard manure as the way of returning to the soil the substances upon which all plant growth depends. Attention was also paid in this period to draining of land and bringing into cultivation of the Fen districts. Naturally, this drainage of land tended in no small degree to the improvements in breeds of cattle, there being nothing like sound land for betterment of root-crops—turnip and mangelwurzel—were introduced into husbandry, and farmyard manure was supplemented by bone manures, salt, etc. From 1840 bones, guanos, superphosphates, nitrates of potash and soda, sulphates and chlorides of potash and magnesia, with sulphate of ammonia, have been utilised as auxiliaries to stable and farmyard manure, and a scientific basis for the respective uses of these manures has been established. The precise uses of these manures, it must be admitted, were but little understood by farmers or gardeners in 1840, the garden routine consisting in the application of dung, any amount of it from the stables, soot from the mansion chimneys, wood ashes from the burned prunings of trees and clippings of hedges, etc., with a store of lime and a seasoning of salt, bones being reserved for vine borders and other fruit-producing subjects, while carbon in the way of charcoal was not overlooked. There was no science in these things but much practical knowledge, yet the gardeners then grew grand Pineapples and splendid Grapes, and the kitchen and dining-room never lacked supplies of prime comestibles. There were followers of Jethro Tull in those days—spadesmen devoted to deep-digging, there being virtue in mixing soil equal to that in good manuring, a fact well known to the ancient Romans and not yet lost to Britons, as witness the precepts of such moderns as Mr. Edwin Beckett, the champion of deep cultivation and grower of prize-winning vegetables.

The old gardeners relished, as did their plants and crops, a little stimulus, such as a pinch of Peruvian guano or its solution in water as liquid manure, and they got from this to the use of nitrogenous, phosphatic and potassic substances, so as to enable them or their successors before the close of the nineteenth century to grow crops two or three times as heavy as were possible without the aid of artificial fertilisers. This is a very important matter in many gardens at the present time when the motor-car is

supplanting the carriage, petrol the horse-power, for the former returns nothing to the soil while the latter yields the indispensable humus for the maintenance of the soil in "condition" and for the deriving of full benefit from applied artificial fertilisers.

Of artificial fertilisers it may be said that three substances contained in them only may be valued and charged for, namely, nitrogen, phosphates and potash, and that a soil lacking any one of these in an available form cannot produce a maximum crop. All three are necessary in well balanced proportions, the quantities of each depending upon the particular requirements of the crop and the available quantities present in the soil. Nitrogen is the main essential of all plant growth, a powerful stimulant without which plants cannot develop (excepting such as derive nitrogen from the atmosphere), while in excess it produces rank growth at the sacrifice of quality. Phosphates are required to promote the healthy growth of the plants and hasten the maturity of their crops. Potash, in combination with nitrogen and phosphates, is the prime factor as regards health—the first wealth—, and is found in large proportions in all plant tissues, lack of fruitfulness and of quality resulting from its absence. All artificial fertilisers contain other ingredients, some useful, others harmful; therefore it is necessary to have a detailed analysis of a special article in order that the gardener may know the substances, and the amounts of those substances which it contains.

Nitrolim, one of the newer sources of nitrogen, contains also lime and carbon, as given in the following approximate analysis: –

Nitrogen. 18 per cent., expressed as ammonia	...	21·85 per cent.
Free lime	...	20—30 „ „
Lime in combination	...	20—30 „ „
Carbon	...	10—12 „ „
Oxides of iron and alumina ...	...	2·5 „ „
Siliceous and other inert mineral substances	...	8—10 „ „

The active principle is the nitrogen, but this, being the form of ammonia, requires time for conversion into nitrate, which depends in a great measure on the presence or application of lime. This is an important constituent of nitrolim. Upon it depends the activity of the nitrifying bacteria, beside which it also is an indispensable plant food, while it tends to sweeten acid soils. Lime also prevents the caking of clay lands, reacting on the soil-particles, and brings potash into soluble form, and thus renders it available for plants.

On sandy soils the best results from the application of potash are secured only in the presence of sufficient lime, for without this substance a considerable proportion of potash—the essence of fertility on sandy soils is liable to be lost. On the other hand, heavy soils, and even the lighter soils, well provided with lime, hold on tenaciously to the potash which they receive, and crops in consequence are healthy and profitable.

Soils poor in lime and to which superphosphate is applied as a fertiliser suffer by the reaction of the acid on other soil constituents. If, however, plenty of lime is present the insoluble compounds cannot form and the phosphate is retained as superphosphate of lime, which is readily available as plant food.

Carbon may be said to be soil-sweetening, and the old-fashioned gardener's practice of using charcoal in potting soil and in vine and other fruit borders, where the vines or trees had to remain long in the same soil, seems a method of soil-sweetening, conjointly with the lime, of considerable importance. The carbon in nitrolim is as pure as the electric furnace can make it, and its extreme fineness renders it readily diffusible through the soil.

The active fertilising constituent of nitrolim, however, is nitrogen, guaranteed 18 per cent., and this in a suitable condition for ready assimilation. In appearance nitrolim is a dark, fine, heavy powder. As regards solubility, quickness of action, and other properties, it closely resembles sulphate of ammonia, and is suitable for most purposes for which sulphate of ammonia is employed. It has a lasting effect and does not wash out of the soil like nitrate of soda, therefore its benefits are not exhausted in the year of application, but continue for some time afterwards provided the soil also contains a sufficient supply of available phosphate and potash. This is likewise a necessity of nitrolim application—either the land must have an ample supply of phosphate and potash from a previous crop or these substances must be provided by admixture with the nitrolim or applied separately. A good general mixture may be made as follows—Nitrolim, 1½ parts; superphosphate of lime, 6 parts, sulphate of potash 1½ parts. The potassic manure should be mixed with the nitrolim first; superphosphate should then be added to the nitrolim and potash mixture in thin layers at a time. Should the heap get hot during the mixing water must be sprinkled over it, care being taken, however, not to add too much or the heap will become pasty. This mixture is a good all-round fertiliser and may be applied at the rate of 9 cwt. per acre, 6¼ per square rod, 3¼ oz. (or a little more) per square yard. The mixture should be applied in preparing ground for sowing seed or setting plants or "sets"—say ten days or a fortnight before sowing or planting, mixing well with the soil. If used as a top-dressing for fruit trees, etc., the manure should be mixed with six times its weight of finely divided damp earth and allowed to stand for a few days before application. This applies to all cases of top-dressing.

Nitrolim has other properties, those of a weed-killer and a soil-pest destroyer being of importance. The quantities of nitrolim before mentioned for separate application, if applied on the first appearance of weeds, destroys most of them, but the dusting naturally affects the growing crop, the leaves assuming a light-yellow colour; but this effect is temporary and disappears, and the consequent remarkable improvement becomes the more apparent through the favourable effect of the nitrogen and lime. Albeit, the use of nitrolim as a top-dressing may not always be considered advisable, for crops that hold it as well as weeds are just as likely to be injured, if not destroyed.

As regards the destruction of weeds and of soil-pests, I may mention that a plot of land badly infested with slugs and with weed seeds was given a dressing of nitrolim in the spring of 1912, lightly pointed in and left for a fortnight, and then well forked over in preparation for setting summer bedding plants. It proved not only free from slugs in that season, and also remarkably free from weeds, but there were very few slugs in 1913, as also fewer weeds.

Nitrolim is nitrogen obtained from the air by a process of distillation at an excessively low temperature. The nitrogen is combined with calcium carbide by an electric process at a temperature approximating 1,000° C, thus forming calcium cyanide, which is subsequently ground to a fine powder, partly hydrated, so as to produce the finished product free from carbide and dustless.

I believe superphosphate mixed with nitrolim in course of manufacture can be obtained from the principal manure manufacturers and merchants in Great Britain and Ireland. The compound presents the advantage of forming a mixture (by the addition of potash or otherwise) easy to handle on the farm and in the garden G. Abbey, St. Albans.—*The Gardeners' Chronicle.*

GREEN DRESSINGS.

Experience in Java.

Trials with Green dressings have been conducted in Buitenzorg, Java, during the past four years, and the following extracts from a translation appearing in the *Kew Bulletin of Miscellaneous Information* (No. 1, 1914) should prove of particular interest to readers who are connected with orchard cultivation in the Tropics.

Leucaena glauca, Benth.—This is one of the oldest manurial plants under trial; it has been used about six years in the gardens and it still gives great satisfaction. The Leucaena or Lamotoro can be used in different ways, the growth should be kept in check according to the plants cultivated. In young coffee plantations it should be kept down, but it may be grown higher underneath Hevea, Ficus, and Cocoanut palms. Lamotoro requires fairly good soil; it does not grow much more than 6 inches and looks very sickly in poor soil.

In West Java the growth is not as vigorous as it is in the East and in Middle Java. Lamotoro may be planted from sea-level up to 3,500 feet. It was noticed that seeds germinated better and grew more quickly, when they were sown at the end of East monsoon, than did those which were sown in the full rainy season. Lamotoro produces plenty of seed, but it soon loses its capacity for germination. One cannot count upon more that 50 per cent. germination after the seed has been kept for four or five months. The seed may be sown in lines as well as scattered in the plantation. In Coffee and Hevea plantations it is advisable to sow the seed at once in broad bands between the trees. The seed will germinate in about a week's time. As long as the soil remains uncovered, weeding about every three or four weeks will be needed. Pruning can be done at intervals of three or five months. The Leucaena is not much attacked by blight or fungi, and will also grow fairly well in half shade. One of the faults of this plant is that the leaves do not last long; the fine leaflets decay after a few days and only the branches and leaf stems remain.

For this reason the Lamotoro is not very effective as a covering for the soil, and it does not protect the plants among which it may be growing against drought as well as does *Clitoria cajanifolia*, the next plant to be described.

Clitoria cajanifolia, Barth.—This plant grows best below 2,000 feet and is one of the best for covering the soil; it is also much used to plant on terraces to prevent the soil from washing away. It lives long and stands cutting very well. In plantations, where it has been sown for three years, it does not seem to die away or lose its vitality. One great advantage of this plant is, that when it has been cut down, it spreads itself over the ground. The sowing is rather troublesome, as the seeds are very sticky and adhere to the fingers. The seed should be sown in lines, half a pod in each hole, and they should not be washed before sowing, because they do not germinate very well after washing. The quickest way in which a piece of ground may be covered is by sowing the seed in lines from 6 to 12 inches apart; after about 4 months the soil will be covered and the plants then can be cut over every 4 or 5 months.

Clitoria is recommended for planting in Hevea and Coffee Plantations. One great advantage of this plant is, that the leaves are tough and last a long time. If the leaves be cut in the dry season and laid round the Coffee plants and Hevea trees, they will last a long time and the plants will not suffer much from drought; the plants also frequently put out a crop of fresh leaves when they have been cut over.

Clitoria like Lamotoro does not suffer from insect pests or fungal diseases.

A further point in favour of this plant is that neither the leaves nor seeds are eaten by human beings or animals.

Before proceeding to a description of the results obtained with the species dealt with below, a few notes are presented in the article with regard to *Tephrosia spp.* It is stated that the great value of the Tephrosias, apart from their other good qualities, is that they do better in soil of poor quality than Leucaena or Clitoria. Although *T. Hookeriana*, Wight and Arn., *var. amoena*, Prain (often wrongly called T. purpurea), has given good results at high altitudes, the most useful species has been found to be T. *candida*, which agrees with West India experience. To continue with the extracts we come to—

Desmodium gyroides, D. C.—This plant is the most valuable of the many species of Desmodium know to us at present. It grows in bushy form and produces many leaves; it can also be cut to any height, and lives a long time. *D. gyroides* is to be found in the neighbourhood of Plaboeanratoe, up to 2,500 feet. It produces a quantity of seed, which is very small, and is therefore advisable to sow it in lines. The seed will germinate in about a fortnight. One drawback to the use of this plant, however, is that often many of the young plants die shortly after they appear above the ground for some reason which has not yet been satisfactorily explained.

This Desmodium is considered to be a very good manurial plant for Coffee and Hevea plantations, since it produces numerous leaves, which form a fairly thick humus layer. It does not suffer from any disease; the only fault to be found with it is, that some of the plants, after being pruned a couple of times, may be attacked by *Corticium salmonicolor*. If the injured plants be removed immediately, however, there is no fear of any harm being done to the cultivated plants.

Indigofera Anil, Linn. This plant is of a bushy habit. The seed is very small, and is sown in lines 18 inches to 2 feet apart; it will germinate in about seven to nine days. When first the seedlings show above ground it is almost impossible to weed amongst them, but after a month to a month and a half the difference between plants and weeds becomes sufficiently distinct for the weeds to be identified. The plantation will be covered with a dense growth after three or four months, and the plants can be cut back after six or seven months.

The plant lives about two and a half years.

Another Indigofera (I. *hirsuta*) has also been tried; but it does not live so long as I. Anil, and as it can only be cut once, it has not proved as useful as that species.—*The Agricultural News*, Vol. XIII. No. 311.

Lime Exhausts Soils.

Applications of Lime will cause exhaustion of the soil if used alone and the land cropped every year; yet it proves highly beneficial whem farm-yard manure, green crops, or chemical fertilisers are also applied. Lime is not strictly what is termed a fertiliser, though it is a substance found in the structure of all plants; but it serves to hasten the chemical action of other organic and inorganic materials existing in soils, and thereby repairs the plant foods for better assimilation by plants, thus being a useful and indispensable assistance on nearly all farms.

COFFEE.

There has been rather a heavy accumulation of Coffee during the Easter recess, and as usual the auctions, though held on only two days have been larger, and consisted mostly of Costa Rica and East India. As more than half the crop of the former has already been sold, it is surprising that the quality of the various marks continues so fine, and with such little variation from the earlier shipment. Another feature is the difference between the quality of London and foreign cleaned; last year the proportion of foreign cleaned was about 60 per cent. of the whole, while this year it is only 33 per cent. No doubt the majority of grocers prefer the London cleaned, as it usually roasts much better than the foreign cleaned, but on the other hand, for storing throughout the year the latter is more reliable and less likely to lose its original flavour. Prices have been well maintained except for the common and medium qualities of East Indian, mostly taken for export which are 1s. to 2s. cheaper. Fine home trade sorts have maintained their values.

LONDON COFFEE RETURNS.

—	Home* Consumption.		Export.		Stock.	
	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.
For week ended April 11 ...	259	362	615	530	22,583	10,069
For 15 weeks ended April 11 ...	4,648	4,307	5,939	4,580	—	—

WORLD'S VISIBLE SUPPLY OF COFFEE, APRIL 1, 1914.

	Stock. 1914. Bags.	1913. Bags.
EUROPE—		
Copenhagen	63,000	67,000
Bremen	129,000	139,000
Hamburg	2,226,000	2,048,000
Holland	766,000	526,000
England	348,000	262,000
Antwerp	1,061,000	948,000
Havre	3,025,000	2,454,000
Bordeaux	53,000	44,000
Marseilles	132,000	152,000
Trieste	364,000	304,000
	8,167,000	6,944,000
Afloat to Europe ...	535,000	303,000
Visible supply Europe ...	8,702,000	7,247,000
The United States ...	1,690,000	2,363,000
Afloat to U. S. A. ...	482,000	304,000
BRAZIL	1,743,000	1,718,000
Total 1st April, 1914 ...	12,617,000	11,632,000
.. 1st March, 1914 ...	12,802,000	11,980,000

—*Produce Market Review.*

*The Home amount contains a proportion for export delivered by cart.

PESTS.

Coffee in the Nilgiris was badly attacked by the Pentatomid bug, *Antestia cruciata*. Scale-insects infested Babul (*Acacia arabica*) at Coimbatore: predaceous enemies were present, but these in their turn were attacked by black ants (*Camponotus compressus*). Isolation of the affected trees by cutting away branches, etc., in contact with the ground, and painting a ring of tar and crude oil emulsion (half and half) round the stem kept away the ants, when the natural enemies quickly checked any further increase of the scales. The rice-bug (*Leptocorisa varicornis*) was observed attacking paddy on a Coimbatore farm; it was found by experiment that small hand-nets were more effective than large bag-nets for control of this pest. *Aleurodes bambusae* attacked giant bamboo at Coimbatore. A Fulgorid, *Pundaluya simplicia*, caused severe but local injury to cholum at Coimbatore in August; as the insect lives protected inside the leaf-sheaths and only sucks the juice of the plants, measures such as spraying are useless; cutting the affected plants for fodder, or flooding the field seem the only practical methods of control.

In November and December 1912, a blue-bottle fly bred in large number in the fish offal along the coasts of South Kanara and Malabar. These flies flew inland and congregated on the spathes of the toddy-palms, sucking up the toddy as it exuded, and discolouring the little that remained with their excrement. The flies also infested the shops of toddy-sellers, causing considerable nuisance. A leaflet in English and in Kanarese on methods of protecting the collecting pots on the trees from access by the flies is being prepared.

Termites (*Odontotermes*) were found attacking young cocoanut palms at Quilandi, Malabar. The case was interesting because the species doing the damage appeared to be identical with that reported as building mounds in the adjacent areas; as a general rule, mound-building termites do not attack growing crops.

Cholum suffered from the attacks of mites; the pest was checked by a Coccinellid beetle, which devours the eggs of the mite; no remedial measures have yet been devised; a similar mite, attacking sugar-cane seedlings, was controlled by dusting with flowers of sulphur.

Broods of Eri silkworms (*Attacus ricini*. Boisd,) were kept through the year, but the climate of Coimbatore is too dry to suit the insect. Steps were taken during the year for the improvement of the mulberry's silk industry of the Kollegal District. A small number of univoltine mulberry silkworm eggs received from Pusa were reared, but proved unsuccessful.

Two cases of the importation of living insect-pests with sugar-cane sent from Antigua and from Java were met with during the year.

The report closes with some remarks on the future development of entomological work in Madras; it is urged that the present work of the Government Entomologist be divided into three groups:—(a) general routine work, (b) research in agricultural entomology and (c) research in medical and veterinary entomology, and that each should occupy the whole of one man's time; the difficulty of doing justice to any one of these branches is pointed out as being very great for one man alone, while the need for research is emphasised by the citation of cases in which valuable crops have suffered serious damage through a lack of knowledge of the proper means of protection.—*The Review of Applied Entomology*.

MOSQUITOS AND MALARIA.

WATSON (DR. M.). *Mosquito Reduction and the Consequent Eradication of Malaria.*—Trans. Soc. Trop. Med. Hyg. London, vii, No. 2, Dec. 1913, pp. 59-82.

A definite connection was traced in Selangor between malaria and its carrier, *Anopheles umbrosus*, which breeds in stagnant pools in the jungle. Drainage was commenced and has resulted in the disappearance of malaria over many acres of land. Not only was malaria found to be connected with jungle pools on low, flat, coastal lands, but it was also intense in the hill lands where there were no swamps and where the water was perfectly clear. Here malaria is carried by a mosquito called by the author at that time N. *Willmori* (properly A. *maculatus*), which breeds in clear streams. Again drainage was resorted to and the percentage of cases was lowered. In the flat open land in Krian, where the irrigation water came from an artificial reservoir, in which dead jungle trees still stood, four species of *Anopheles* were present—*rossi*, *kochi*, *sinensis* and *barbirostris;* but the rice-fields were practically free from malaria. In the large open valleys, in addition to the four *Anopheles* found in Krian, three others were present at Bukit Gantang, namely, *umbrosus*, *nivipes* and *albirostris*, all of which carry malaria; and here there was much malaria present. A. *maculatus* was found on the hills at the side of the valley. Investigations for means of reducing the number of mosquitos are being carried out. The distribution of malaria in India is very similar to that in the Malay States. In India, A. *maculatus* is the commonest *Anopheles* and occurs in the Duars and the Jeypore hills; it has been reported from Ceylon and has been found in a Dutch island off Singapore and also in Hong Kong, and wherever this species is found malaria is severe. In Italy, where there was only a pool-breeding *Anopheles*, the hills were free from malaria, and where open drainage was possible malaria could be eradicated.

The questions then arise: Is it possible that throughout the tropics one would always find a hill stream-breeder and intense malaria; and are all pool breeders as amenable to open drainage as A. *umbrosa* on the flat land of the Malay States? For further investigations visits were made to Sumatra, British Guiana and Barbados. In Sumatra the absence of malaria is very extraordinary, and so far A. *maculatus* has not been taken there. There was some evidence of malaria near an island swamp, but no trace of it in the hill land. In Panama, drainage was the most important measure against *Anopheles* and oiling was resorted to where drainage was impracticable; while the success was at first due to protection from bites as much as to *Anopheles* reduction, the latter measure has become the more important. Here the chief *Anopheles* are *Albimanus* and *argyrotarsis*, the former breeding in almost any pool, but not in running water. British Guiana is a country full of waterwaves and canals, and the filling up of drains, which are essential to the plantations, is impossible; the alternative appeared to be quinine, which was the policy adopted. Here the spleen rates were high in comparison with the death rates, but clearly 75 per cent. of the malarial problem in British Guiana is already solved and the way to eradicate the disease is by Anopheline reduction. In Barbados the author thinks that the absence of breeding places is the reason for the absence of malaria, rather than the presence of "Millions." In all cases it would seem that drainage indicates the way to overcome the disease.

In the discussion which followed Sir Ronald Ross expressed agreement with the methods advocated by Dr. Malcolm Watson, and referred to his own work on the extermination of malaria in India, where he used precisely the same method, the report of which was published tn the *Indian Medical Gazette* for July 1899. Sir R. Ross also stated that quinine as a preventive has distracted attention from the fundamental method and expressed doubts whether quinine is really cheaper for the benefits given than is mosquito reduction. Dr. D. Thomson was of opinion that after the difficult work done in the Malay States it ought to be quite possible, by clearing the jungle, to reduce mosquitos in all the settlements at the mouth of the Niger. Dr. Andrew Balfour, referring to a letter from Mr. Sawer working in the Sudan, says that the results obtained by drainage in that country speak well for that method. Here the drains are deep, and graded drainage channels cut into the soil and undoubtedly benefit agriculture at the same time. The statement made by Dr. Watson that the absence of malaria in Barbados was due probably to the absence of suitable breeding places was criticised by Dr. G. C. Low, who stated that he found permanent collections of water forming swamps especially near Worthing, about three miles from the Capital of the island. From water taken from these swamps to St. Vincent, a neighbouring island, A. *albipes* and *argyrotarsis* (the West-Indian malarial-carriers) were reared with ease. The isolation of the island, the situation of the suitable collections of water away from the harbour and main town, and the difficulty of mosquitos getting ashore from the ships which lie in an open roadstead a mile or more from shore, were considered by Dr. Low to be the chief factors dominating the absence of these insects; he agreed that the Barbados "millions" were not the cause. Dr. Low also stated that he has found albimanus breeding in running water. Dr. Bahr stated that in Ceylon malaria is essentially a disease of the low country, especially of the rice districts. Here A. *culicifacies* is the chief carrier; A. *maculatus*, was encountered once in a swift flowing stream. A. *albirostris*, contrary to the experience of Dr. Malcolm Watson in Malaya, breeds in the muddy parts of paddy-fields. To a less extent malaria is a disease of the jungle in Ceylon. The problem of the abolition of the paddy-field is one of importance to the Colony and Dr. Bahr thinks that paddy-fields in the vicinity of towns should be abolished. He also suggested that the reason why a mosquito will transmit a parasite in one place and apparently fail to do so in another ought to be more fully investigated. The President, Sir R. H. Charles, stated that there is no question that improvement in agriculture is one of the most necessary works against malaria. In India this is a difficult task and village sanitation is at the root of the whole matter. Attention must be given to drainage, improved methods of agriculture, oiling, screening and the proper use of quinine; but above all, the co-operation of the population in the methods undertaken must be gained. Dr. Watson, referring to Dr. Bahr's suggestion with regard to abolishing rice-fields, thinks that such a step cannot be recommended, and notes that in British Guiana the mosquito can be held in check by a system of completely flooding the rice-fields, and then rapidly drawing off the water. With reference to sanitation, Dr. Watson thinks that oiling all the collections of water over the country would never rid the country of malaria; it whould be better to show the people that it is in their interests commercially to grow rice in a certain way, and by showing them a profit and incidentally reaping a health advantage out of it, the object desired is most likely to be attained.—*The Review of Applied Entomology.*

CORRESPONDENCE.

C, 24 of 1914. Bournemouth, England,
27th April, 1914.

Scientific Assistant, Mysore.

THE EDITOR.
Planters' Chronicle.

Dear Sir,—I note that in your issue of 4th April, Mr. C. S. Crawford states that he knows nothing about the Kalisyndicate experiments and complains that the initiative in such experimental work should come from the Scientific Department.

This reveals another 'curious fact,' *viz.*, that Mr. Crawford does not take the trouble to read the *Planters' Chronicle* or follow the business done at the Annual Meetings of the U. P. A. S. I. Had he done so he would have found a very full account of the Kalisyndicate scheme in Vol. VIII. p. 96 of the *Chronicle* and in the 1912 Book of Proceedings, p. 42.

The Scheme has been before the planters for *two years* and yet Mr. Crawford pleads ignorance of it! Can he be surprised that at times the Scientific Department complains of 'lack of co operation,' especially when they have no Experiment Station of their own to make them independent?

Yours faithfully,

RUDOLPH D. ANSTEAD,
Planting Expert.

Vellore, 11/5/1914.

Labour Commission.

THE EDITOR,
Planters' Chronicle.

Dear Sir,—I trust you will condone my presumption in writing to you on Planting matters not being one of your community; but having sat at the feet of my father Mr. A. Ff. Martin I feel I have something to say on the subject of the Labour Department.

Now if you or I were to start on an expedition to the South Pole we would make an excellent attempt at making a list of the stores, etc., which we required, and think that our list when completed would be as perfect as human intelligence could make it. Then, if in a spirit of humble self-effacement, we were to show our list to Sir E. Shackleton or some such mighty man of valour he would probably laugh till he was blue in the face, and strike out 99% of the articles we thought we should want and substitute others.

The Planting Community of Southern India seem to be in the same sort of position. They want a Labour Department or Commission or something of the sort but they have no experience, so although they may think that the little ideas they have in the back of their minds are perfect, there are others who have experience who do not think so.

This letter as you no doubt perceive is intended to urge on the conditional supporters. In any case after the 5 years' trial stipulated they will be able to judge of defects with far greater knowledge than at present when they don't know how the Labour Department will work, and at the end of that period any improvements which may suggest themselves can be brought in with much less risk than at the present moment, when one can't be sure, whether any modification of the present scheme would not wreck the whole plan.

I beg to remain, Sir,
Yours truly,
A. C. MARTIN

Experiments.

THE EDITOR,
Planters' Chronicle.

Dear Sir,—I notice what appears to be a very serious omission in the scheme drawn up by Mr. Birnie for testing the value of various fertilisers for Coffee, *viz.*, the omission of Nitrate of Potash. Surely this ought to have been included as it is the only Nitrate indigenous to India and is moreover a festiliser of acknowledged merit. In cost also it is cheaper than any Imported Nitrate, and contains not only Potash but Nitrogen—both in readily available forms.

NEMO.

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4 F, South Parade,
Bangalore, 20th May, 1914.

Purchasing Potash Manures in England.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Dear Sir,—Recently I have heard it rumoured that a few planters have expressed their intention of endeavouring to purchase Potash Manures at a cheaper rate in England.

In case of others being similary inclined, might I claim the courtesy of your Paper to bring to the notice of Planters generally the following facts concerning this fertiliser.?

Practically, the whole world's supply of Potash comes from the now famous mines in Germany, the output of which last year amounted, in round figures, to 10,000,000 tons. The responsibility for the sale of this enormous output is centred in a Syndicate known as the "Potash Syndicate" which is largely under the direct control of the German Government and which is subject to the "Potash Laws" of the Reichtag. This Syndicate has appointed Sales Agents in every quarter of the globe and to all these Agents (outside Germany) Potash Salts are sold on the same terms. Moreover, the actual commission permitted these Agents is the same everywhere.

As the Sales Agents in England, in terms of their Agency contract, are not permitted to export unmixed Potash Salts from that country, the export of these Salts from England would have to be made through the agency of a 'middleman' who would naturally claim a further commission. Again, as the freight direct from Germany to India is appreciably less than the same *via* England, it will be evident that this fertiliser can be purchased more cheaply and conveniently in India (e. g., from the local Sales Agents Messrs. Peirce, Leslie & Co., Calicut and Messrs. Parry & Co., Madras).

Might I also take this opportunity of pointing out the possibility of obtaining this fertiliser on slightly more favourable terms by placing orders some months in advance? All potash exported from these German Mines during the summer is floated down the River Elbe in barges to Hamburg for shipment, while, if exported during winter,—when the Elbe is frozen,—this fertiliser has to be railed to the port of shipment, thereby incurring increased transport charges previous to shipment. Hence Potash ordered in time for shipment in summer is despatched by the cheaper route.

Again, when orders are placed in advance, Agents can import larger quantities at the one time, thereby securing the benefit of any cheaper rate of freights for large lots.

In consequence of the foregoing, Planters will see that there is no probability of obtaining these Salts cheaper in England than in India and that their interests are best served.

(1) by their ordering the Potash from the Local Sales Agents, and
(2) by placing their orders some months before the manures are actually required.

Thanking you in anticipation,

I am, dear Sir,
Yours faithfully,

ROBT. BIRNIE,
Agr. Officer of the Potash Syndicate.

MOREU (L). *Prophylaxie du Paludisme dans l'Afrique Orientale Allemande.* (*Malaria Prophylaxis in German East Africa.*)—*Bull. Soc. Path. Exot., Paris, vi, no. 8, 8th Oct. 1913, pp.* 569-571.

The author says that the German colonists have from the outset done what they could to improve the sanitary conditions of their new country, and in this short paper he deals with what has been done especially against endemic malaria. He says that, even in the good season, the climate is particularly exhausting and depressing, and that though during the construction of the railway from Dar-es-Salaam to Tabora a large number of natives fell victims to malaria, on the other hand the drainage and other works have effected the greatest improvement. The use of petroleum, he was told during his visit, had not yielded very satisfactory results, and the colonists are now busy raising fish as destroyers of mosquito larvae. Attention, however, is being more especially paid to individual prophylaxis. Quinine for this purpose is not in great favour with the colonists and officials, but on the other hand metallic gauze is used in all buildings and some of them, especially the fine Colonial Hospital, are so thoroughly protected in this way that the author says that it must be practically impossible for a single mosquite to enter. In the private houses it is common to find a portion of the verandah elaborately protected with wire gauze in such a way that the occupants may sit there in the evenings and drink their beer in peace. Every bed is provided with a mosquito curtain.

The authorities realise that the natives are the principal source from which the mosquitos, against which they seek to protect themselves, derive the malarial poison, and that so long as they are surrounded by infective natives, so long will they, if bitten, be liable to malaria. In order to reduce this to a minimum the native quarters are regularly investigated every week and samples of blood taken, and in those cases in which the organism is found, the individual is at once subjected to an intensive quinine treatment and everything is done to prevent the mingling of infective natives with the uninfected. The regular inspection is most rigorously carried out. The caravans present the greatest difficulty because the natives composing them penetrate into the most gravely infected areas. These caravans are inspected by medical police throughout the whole route.

The result of these vigorous and careful measures has been to reduce the mortality amongst the natives very considerably and the cases of fever amongst Europeans have fallen from 40 per cent. to 10 or 15 per cent. The pernicious type has become rare, and the author says that though the results are perhaps not all that might have been hoped for, the energy and persistence of the colonists in combating the disease are worthy of all admiration.—*The Review of Applied Entomology.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Labour Barometer to the end of this week has risen to 84,867'41 acres, or close on 85% of the required supporting acreage. Only four weeks remain to receive the balance and we hope the common cause, self protection, and common sense will induce waverers to put on their acreage *at once.*

We publish the proceedings of two District Planters' Associations: those of the Nilgiris and Mundakayam, and specially commend to the notice of all our subscribers, the report by the Delegates of the former Association on the control of the Labour Department and their appeal to "sitters on the fence." As regards the control of the Labour Department the remarks should finally dissipate any doubts as to its control.

By the kindness of Doctor Leslie Coleman we are enabled to publish a most valuable and interesting article on Green Bug. Every Mysore and Coorg planter should learn the precepts inculcated by heart and put them into daily practice. Unceasing vigilance is required, and we recommend a pessimistic view of the subject and their motto should be "Let Us (S) Pray."

Mr. Bainbrigge Fletcher, the Imperial Entomologist, favoured us with a visit on his return from Coorg, where he had seen and collected Green Bug. The two most vital points that struck us were that the scale will live for twelve days *at least* on dry leaves and twigs; and that Mr. Bainbrigge Fletcher discovered a parasite in the scale, which must tend to reduce the numbers. He kindly showed us a book he is bringing out on the Insects of Southern India, which is beautifully illustrated. We recommend strongly that *every* planter should order one. The price is only Rs. 6.

We have very much pleasure in publishing the first instalment of a series of articles from Mr. Aylmer Martin, on Motherhood and Infancy among Estate coolies.

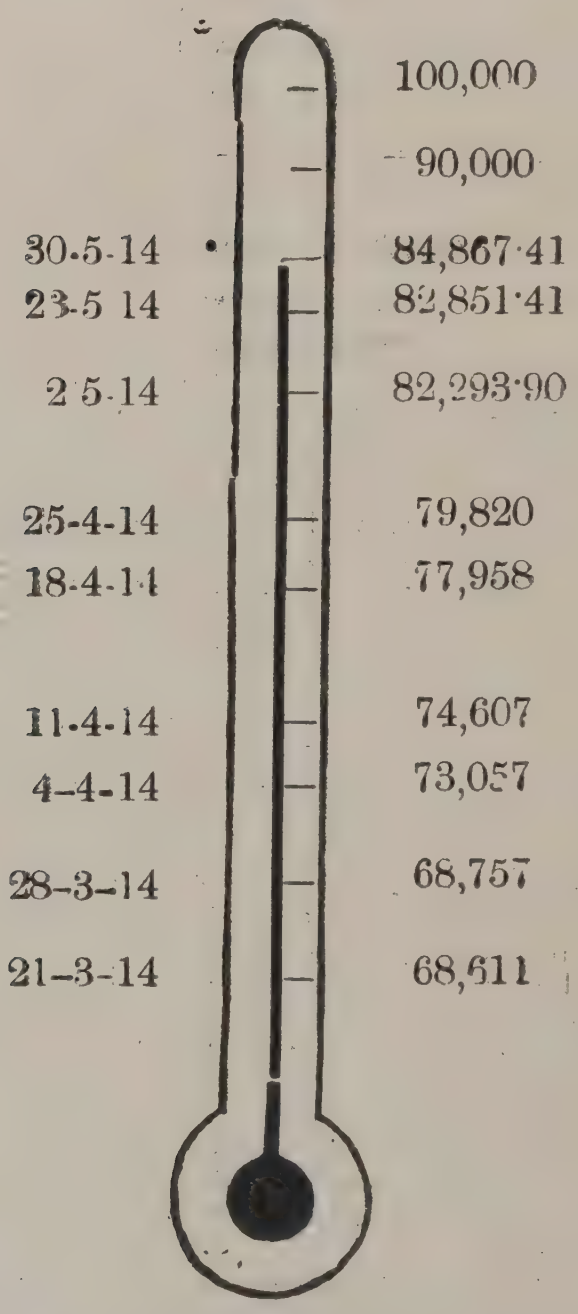
In our correspondence columns we publish a letter from the Acting Chief Secretary to the Government of Madras regarding the delay of the Execution of Warrants.

Also a letter from Mr. Lund, which we hope will be dealt with by Mr. Barber, definitely, decisively and authoritatively. In no case do we find a mention of any "threat." Mr. Lund has dealt with the whole matter disingenuously.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

3rd May, 1914.

At the Meeting of the above Association held at the Collector's Office, on Saturday, 2nd May, 1914.

PRESENT.—Messrs. J. S. Nicolls (Chairman), Hon'ble Mr. E. F. Barber, C. H. Brock, W. A. Cherry, G. W. Fulcher, A. R. Piggott, L. L. Porter, A. A. Brown, G. W. Church (Honorary Secretary). *Visitors*: Messrs. Waddington and R. Brierly.

The proceedings of the last meeting were confirmed.

110. Mr. Brock read the Delegate's Report on the Extraordinary General Meeting of the U. P. A. S. I. held at Bangalore, 11th March, 1914.

DELEGATES' REPORT,

ON THE EXTRAORDINARY GENERAL MEETING OF THE U. P. A. S. I., HELD AT BANGALORE, ON 11TH MARCH, 1914.

Gentlemen,—According to your instructions we attended the General Meeting of the U. P. A. S. I. on the 11th and 12th instant.

A report of most of the proceedings that took place in open meeting has appeared in the Press, and the full discussions in Committee will be published by the Association as soon as possible.

THE PROPOSED LABOUR DEPARTMENT.

There were only two contentious points raised, namely:—

(*a*) a reduced subscription for Coffee, and

(*b*) the control of the Department.

(*a*) As regards the former, the District Associations of Mysore and Coorg were soon convinced that if the point was passed the whole scheme would be wrecked, and unanimously agreed to the two rupees per acre all round.

At the present moment, with Tea prices booming, you hear a great deal more as to necessity of a larger number of coolies for a given area than was considered necessary fifteen years ago when Tea prices were at low level. Twenty years ago, when Coffee prices were in the neighbourhood of £100 per ton and when there was no bug, as many, if not more coolies were required on a given area of Coffee as on the same area of Tea. These conditions of labour demand are at present reversed, but it is a wonderful prophet who can assert that they are permanently so. Similarly, Rubber was, a few years ago, held to require at least one and a half coolies per acre, but for estates in full bearing and with the present improved methods of tapping, it is realised that from a half to three quarters of a cooly per acre, or rather less than is at present necessary for coffee, is ample. With conditions continually changing, it is palpably impossible to differentiate between the various products even for so limited a period as five years. The starting of a department, such as the one proposed, is, necessarily, of an expensive nature. The only way in which the cost to the individual planter can be reduced is by obtaining the wholehearted support of a very large majority of the planting interests in Southern India. If any man says that he thinks that the Labour Department is a move in the right direction, and does not support it from the start so as to ensure its success, and so ensure its becoming cheaper and less of a drain on his pocket in future years, that

man is stultifying his own opinion. The men who most pride themselves on being most successful with labour, and who assure you that they can get all the labour they want, even they admit that they have a great deal more difficulty in maintaining their staff of coolies than they used to have a few years back, and that the difficulty yearly gets worse. Your having all the coolies that you require now is but a poor excuse for not supporting the Labour Department. Is not insuring your personal self against this yearly increasing worry and trouble in getting and keeping your labour worth Rs.2 per acre ?

The sooner everyone starts supporting the Labour Department, the sooner will this worry and trouble be lightened, and the sooner you will be insured against possible losses of advances, even if you have not suffered in this way hitherto, and, last, but not least, the sooner you will reduce the amount of the subscription required per acre for the maintenance of the Department.

Gentlemen, we have put these remarks in this report, not only because they embody much of the discussion that took place at the meeting in Committee, but because the area that has promised support is still far short of the required amount, and we wish you to appeal again to the many men in this District who are "sitting on the fence" to join hands with those who are bearing the brunt of the struggle on behalf of the whole planting industry of Southern India.

(*b*) As regards the control of the Department, there seems to be a widespread feeling that the Labour Department is to be controlled by Messrs. James Findlay & Co., Ltd. We can but reiterate what has already been published, that the Department if started, is to be worked by the Executive Committee UNDER THE DIRECT CONTROL OF THE U. P. A. S. I. COUNCIL. Hence any point raised by any subscriber will be dealt with by a governing body which represents every Planting District, and not solely by any individual or firm.

THE SCIENTIFIC DEPARTMENT OF THE U. P. A. S. I.

Under this heading the Meeting was faced with the difficulty of wanting to expand the department and not to let it remain at a standstill, and at the same time not to tax planters any further, owing to the heavy drain on their pockets from the new expense of the Labour Department. The U.P.A.S.I. is in a position to pay to Government, out of its own funds, an increased yearly grant towards expenses, but has not sufficient to be able to do all that is required at its own expense. To ensure continuity of work, and to enable us to establish the Department on a more permanent and stable basis, it is proposed to ask Government, in consideration of the increased grant the U. P. A. S. I. is prepared to put down out of its own funds, to take over the whole of the U. P. A. S. I. Scientific Department, and to run it as a branch of the Department of Agriculture, Madras, but under the guiding control of the U. P. A. S. I. as to the work to be done. At present this is but a suggestion, and it is for District Associations to discuss the proposal and send on their decision to the U. P. A. S. I. as soon as possible.

In conclusion, gentlemen, we have to thank you for having elected us as your representatives, and we hope that our endeavours on your behalf meet with your approval.

(Signed). L. L. PORTER.

" C. H. BROCK.

Proposed from the Chair that a hearty vote of thanks be passed to Delegates Messrs. C. H. Brock and L. L. Porter for their interesting report and that the report be printed in the proceedings.—Carried unanimously.

111. *Scientific Department.*—Proposed by Mr. Brock and seconded by Mr. G. W. Fulcher that the Chairman with the Hon'ble Mr. E. F. Barber be asked to draw up a circular which shall be issued to members and that the matter be brought up for further discussion at the next meeting.

112. *U. P. A. S. I. Meeting.*—It was resolved that July 6th would suit the Association.

113. Kil-Kotagiri Road.—Mr. C. H. Brock gave his reasons why the Sub-Committee appointed to consider the matter of the estimate of the cost of this road was at present unable to give any further details.

114. *Central Travancore Planters' Association.*—Resolved that as this Association did not subscribe to the Institute, it did not feel justified in giving the support asked for.

115. *Next Meeting.*—It was resolved that the next meeting should be called for the 22nd June, or as soon as possible after the preliminary agenda of the U. P. A. S. I. meeting had been issued.

A vote of thanks to the Collector for the use of the room and to the Chairman terminated the meeting.

(Signed) J. S. NICOLLS,
Chairman,

(„) G. W. CHURCH,
Honorary Secretary.

Mundakayam Planters' Association,

Mundakayam,
Travancore,
S. India.

Minutes of General Quarterly Meeting of the Mundakayam Planters' Association held at Yendayar Bungalow, on Saturday, May 2nd, 1914, at 10 a.m.

PRESENT.—Messrs. H. B. Kirk (Chairman), M. H. Byfield, H. J. Byrne, R. Craig, E. S. Conner, E. E. Evre, J. H. Fitchett, E. R. Gudgeon, Eric Hall, J. Irvine. R. Lester, H. Lord, R. C. Milbank, J. J. Murphy, L. Price, H. J. O'Reilly, F. Simmons, J. H. B. Sullivan, G. West, R. L. M. Yeates and Edwin Vincent (Honorary Secretary). *By Proxy*: Messrs. G. Atkins, R. Harley and A. Hammond.

BUSINESS.

1. The minutes of last Meeting were taken as read and confirmed.

2. The Honorary Secretary read the minutes of an Extraordinary General Meeting held at Peravanthanam on 18th April, 1914. After some discussion Mr. West moved that the minutes be confirmed. This was seconded by Mr. Hall and carried unanimously.

3. Report of Sri Mulam Delegate,

The Honorary Secretary said—Mr. Chairman and Gentlemen,—The tenth session of the Sri Mulam Popular Assembly was held at Trivandrum on Thursday, 19th February, 1914, and following days. As your Delegate I was present on the opening day, and thence regularly until the fourth day of the session when my first subject came up. This was the question of grazing lands and the stray cattle nuisance. As far as grazing lands are concerned I mentioned that land was available south of the Needum Thodu at the 35th mile, and also at the 34th mile, but the Dewan remarked that these were Devaswom lands and as such could not be given to us. He added that if we could point out Sircar land in the District as available Government would consider the matter. With regard to the establishment of a cattle pound the Dewan said that sanction would be given to the Association to erect a pound to be handed over to Government. Whilst on this subject of the stray cattle nuisance I mentioned the need of Bandy Petahs on the Kottayam-Kumili Road, and the Dewan said this would be taken in hand. On the fifth day Public Works were discussed and as instructed I asked Government for a grant-in-aid of Mr. Atkin's Road and bridge from Vellanadi to Mundakayam. I left in the hands of Government a plan showing the position of the road and pointed out to the Dewan from that plan how this road would connect Mundakayam with Rani, by the shortest route, and so link up with the Rani Road to Punalur or to Agasteeswaram *via* Padmanabhaparam thus bringing Mundakayam within 55 miles of a railway. The Dewan promised consideration.

Mr. Vincent was accorded a vote of thanks for having represented the Association at Trivandrum.

4. MUNDAKAYAM HOSPITAL.—The Chairman said he had spoken to the Dewan on this subject on the occasion of the Dewan's visit to Mundakayam recently, who informed him that the money, *viz*; Rs.28,000 had been granted, but had not yet been budgeted for. This would, however, be done shortly.

CATTLE POUND.—The Honorary Secretary said the Tahsildar, Peermade, had been instructed by the Superintendent, Devicolam Division, to locate a site for the cattle pound in Mundakayam.

U. P. A. S. I. DELEGATE.—The Honorary Secretary announced that the meeting this year would take place at Bangalore on Monday, July 6th. Mr. Murphy proposed that Mr. Milbank be elected to represent the Association and this was seconded by Mr. Gudgeon. Carried *nem. con.*

It was decided that the matter of instructing the Delegate be left to the Committee, and the Delegate was voted Rs.250 expenses.

7. MUNDAKAYAM CLUB—Mr. Gudgeon read the minutes of the last Club Meeting which was recorded.

8. RESIGNATION OF THE HONORARY SECRETARY.—The Chairman said he regretted to announce the resignation of the Honorary Secretary. He dwelt on the past services of Mr. Vincent and the able manner in which he had fulfilled his duties; he further proposed a vote of thanks which was carried unanimously.

9. ELECTION OF HONORARY SECRETARY.—Mr. Milbank was proposed by Mr. Eyre and seconded by Mr. Murphy. On being put to the ballot, Mr. Milbank was elected by 44 votes to 23.

10. Read letters from Mr. S. C. H. Robinson and Mr. Slater accepting the Association's invitation to become Honorary members.

Read letter from Mr. J. A. Richardson regarding cost of survey of the Kodimatha Landing Stage. The Honorary Secretary was authorised to pay Mr. Richardson's bill of Rs.20-

Read letter from the Honorary Secretary C. T. P. A. *re.* meeting of Delegates from all Travancore, West Coast and Cochin Associations.

The idea met with unanimous support. Mr. Murphy proposed that a Secretary should be elected by the South Travancore P. A. and that the first meeting should take place in Quilon on a date in June afterwards to be decided upon. Seconded by Mr. Milbank and carried unanimously. It was further added that Mr. Hall should represent this Association.

Read letter from the Honorary Secretary, C. T. P. A. with resolution that "The Planting Member of Council should be a member of the Lady Ampthill Nursing Institute Committee." This met with no support, but the Chairman sent round a subscription list and a sum of Rs.190 was promised at the meeting for the above Institute.

Read letter from Mr. Dominic Thoman *re.* the removal of the Kanjirapalli Court House to a site near the T. B. Mr. Murphy proposed that the authorities at Trivandrum be approached. Carried.

Read letter from Mr. M. P. Koshy requesting support for his hotel. It was decided to inform Mr. Koshy that the Association could not move in the matter.

Read letter from the North Travancore Planters' Association *re.* importation of Tobacco by post into Travancore. It was decided to support the N. T. P. A. in their application to Government.

Read letter from Postmaster, Mundakayam, *re.* local P. O. matters.

Mr. West proposed that "This Association deprecates the proposed removal of the P. O. to the 34th mile and considers an endeavour should be made to procure a site near the present building." Carried *nem. con.*

11. DATE AND PLACE OF MEETING.—The Chairman announced that the next meeting would take place on Saturday, August 1st, 1914 and will be held at the Mundakayam Club.

This concluded the business and the meeting terminated with a vote of thanks to the Chair and to Mr. Murphy for his hospitality.

H. B. KIRK,
Chairman, M. P. A.

R. C. MILBANK,
Hony. Secretary, M. P. A.

BELGIAN CONGO.

Prohibition of Exportation of Adulterated and Impure Rubbers.—The "Moniteur Belge" for the 11th April, contains a Belgian Royal Decree, dated the 14th March, prohibiting the exportation across any of the frontiers of the Belgian Congo of the adulterated and impure rubbers. The Governor-General is to issue an Ordinance determining what rubbers are to be regarded as adulterated and impure. All rubber presented for exportation must be accompanied by a certificate attesting its examination, delivered in accordance with the conditions established by the Ordinance of the Governor-General.—*The Board of Trade Journal.*

GREEN BUG.

Green Bug on Coffee in Mysore and Coorg.

An account of my tour in Coorg which I made in company with Mr. Anstead in February and March last is long overdue. As Mr. Anstead has already written a general account of the tour, I shall confine myself to the one subject of Green Bug. In doing so, I shall supplement observations made by me in Coorg by those made since by officers of the Department in South Mysore.

Although I had not sufficient time to make a thorough inspection of Coorg coffee, it is perfectly clear that the Green Bug is very widely spread. I saw it on estates near Siddapur and apparently it is to be found scattered through the estates all the way north from there to the Mysore boundary. In Mysore, it is already widely distributed in Manjarabad Taluk and has extended into Mudigere and Belur Taluks as well.

At the time of my visit to Coorg, there had been a very long period of dry weather. Moreover as the coffee had borne a very heavy crop, there were practically no leaves left on the trees. The conditions were, thus, very unfavorable for the spread of Green Bug and, as was to be expected, the pest was found only in small numbers on the few green leaves that were left on the trees. Of the Green Bugs found, the majority were quite young and it is was evident that development had begun, in most cases, not more than three or four weeks previously.

I found on the whole that the European Coffee Planters were alive to the gravity of the situation and on all the estates which I visited, even on those where Green Bug had not yet put in its appearance, sprayers and spraying materials were in readiness for use in combating the pest as soon as it puts in its appearance.

I unfortunately had no opportunity of visiting estates owned by Indian Coffee Planters nor of conversing with the Indian Coffee Planters themselves; so I am unable to say whether they are as alert to the danger as are the European Planters. From experience in Mysore I am led to believe that Indian Planters, if properly guided by a scientific officer, can be led to see the serious nature of the situation and are quite prepared to resort to thorough combative measures for the control of the pest. However, I look upon the guidance of such an officer as essential. One of the first things required in Coorg is a thorough survey of the estates both Indian and European to ascertain just how far the pest has spread and this can be satisfactorily done only by a trained officer.

Notwithstanding the circulars and bulletins which have already been published on the subject, there are undoubtedly still a goodly number who cannot recognize Green Bug when they see it, and there are probably a number of estates where it is present and where it will not be noticed or identified until it has spread over hundreds if not thousands of trees unless a survey such as proposed is made.

As I have already pointed out the most of those European Planters in Coorg, whom I had the pleasure of meeting, are alive to the gravity of the situation. There are however, some who look upon the pest as one of no very serious importance and who expect the natural means, fungus and otherwise, to furnish a sufficient check to it. On the other hand, there are planters who take the extremely pessimistic view that the case is a hopeless one, that the pest is bound to spread, no matter what is done and that soon its wide distribution in estates will make spraying quite out of question.

Both of these points of view are deplorable, as they tend to prevent that concerted effort which is absolutely essential if the pest is to be kept within bounds. It is of course impossible as yet to say what we can do in the way of checking the pest but it seems to me quite certain that, if a *laissez faire* policy is adopted, it is likely to be most disastrous to the coffee industry in Coorg and Mysore.

Now with regard to measures which can and should be taken to keep this pest under control and to check its spread, as far as we are at present aware the only artificial method which is at all effective is the application of an insecticide. An effective wash has already been recommended but it seems to me highly probable that a cheaper and at the same time equally effective insecticide can be worked out. At the present moment the Mysore Department of Agriculture is experimenting with a fish oil resin soap wash which promises to be decidedly cheaper than the present resin soap soda mixture. The results of experiments are not yet available. The Department has experimented with a number of other mixtures for scale insects in the past six months but none of these have proved as effective as resin soap.

With regard to the mode of application of the insecticide I think it is now clear to most that spraying is a more economical method than brushing. Brushing may be practicable where a few trees have been attacked but where the infestation is at all extensive it seems to be impossible that it can compete with spraying. There is, of course, probably a greater danger of slipshod work with spraying than with brushing and there is moreover a considerable difference between spraying and spraying. Thus the ordinary Knapsack sprayer where the pumping and spraying are done at the same time seems to me a quite unsuitable implement. In coffee where the cooly has to hold aside the bushes and direct the spray, it is, practically impossible for one man to do the work with such a sprayer. There is another point in which the pressure sprayer is distinctly superior and that is with regard to the penetration of the spray. With a proper initial pressure, the spray emerges uniformly fine and allows for a very even distribution and penetration. On the other hand, where the character of the spray depends upon the work of the cooly who is carrying the sprayer, the syraying is likely to be very unequal in its effectiveness.

With regard to the pressure sprayers, I have, up to the present, experimented with only two, an American and a German Sprayer, Of these, undoubtedly the German one is distinctly superior., This sprayer, the Holder, was, as far as I am aware, first introduced to India by me in 1909 when I began to use it in connection with Koleroga of the Areca palm. All of the sprayers brought in five years ago are still in use and the amount of repairs required has been insignificant.

Various other methods have been adoped for the destruction of Green Bug such as flaming with a torch, spur pruning and burning the prunings etc, These are pretty drastic measures and I do not think will be found to be at all effective. It may, of course, be essential to prune heavily so as to bring the trees into a shape such that they can be effectively sprayed but I should be inclined to expect spur pruning with the consequent forcing of many new leaf buds to do more harm than good, supplying, as it is likely to do, a large amount of tender green leaf for the Bugs to feed upon. Furthermore the process of pruning itself is likely to lead to the spread of the Bug by means of the pruners, as they go among the coffee.

Another question which deserves and is receiving considerable attention at the hands of coffee planters both in Coorg and Mysore is the

destruction of ants' nests. There are a number of different species of ants which build nests in the shade trees on coffee estates or in the coffee. The question as to which of these ants if any take an active part in protecting and spreading the Green Bug requires further investigation but there is no doubt that the sound policy, at present, is to treat them all as dangerous and to destroy their nests as thoroughly as possible. A blast lamp seems to be the most efficient means of destruction that can be employed.

The question of the original introduction of the Green Bug into Mysore and Coorg is an important one but the one of immediate interest to coffee planters in Coorg and Mysore at present is, not how the Green Bug has been brought into these Districts, but how it is at present being spread. The matter is being investigated by the officers of the Mysore Agricultural Department and it seems highly probable that the chief means of spread is the cooly himself. How this is to be avoided I am not prepared to say but I certainly think that the greatest care should be taken to isolate the patches where the Green Bug is now present and to avoid the movement of coolies from infested to unifested areas during the day's work.

With regard to the original manner of infestation, we are still unable to state definitely how it took place. The theory, however, that it was brought in from the open country has little if any real evidence in support of it. In Mysore, careful search extending over two months has been made in villages from which carts used for carting manure to estates in the infested Taluks have come and no signs of Green Bug have been found. On the other hand, *Pulvinaria psidii* was found in almost every village visited and it is, I think, this scale which has been mistaken for Green Bug by the coolies when they reported that the Green Bug is commonly to be found in the open country.

I have dealt thus far with direct combative measures and I cannot too strongly emphasize the necessity of continuous effort along these lines by coffee planters in the infested areas. I now wish to deal briefly with the natural means of control.

Undoubtedly the most effective natural means of control at present existent in Mysore and Coorg is the fungus *Cephalosporium lecanii* which makes its appearance with the break of the monsoon and which has, in most cases, led to an immense reduction of the pest during the monsoon season. From enquires made by me it appears, however, that this fungus, has in the past, been by no means uniformly distributed and I believe that a good deal of valuable work can be done by its artificial distribution early in the monsoon, especially in those estates where it has previously not been wide spread. Probably the most effective and certainly the easiest way of spreading the fungus is to tie up branches bearing the fungus in trees infested with Green Bug and this should certainly be done. It is proposed to test the efficiency of spreading the fungus by means of spraying its spores suspended in water during the coming monsoon. As every one now knows, the great drawback to the fungus control of the scale lies in the fact that the fungus requires decidedly moist conditions in which to develop and this is a drawback which it is quite impossible for us to overcome. The fungus is and will remain effective as a means of control only during the monsoon season.

The question now remains as to whether there are any natural means of control which are or can be made effective during the dry season for, if we could find any such, the danger from Green Bug would undoubtedly be greatly minimized. The answer is that there are undoubtedly natural enemies of the Green Bug already present in these newly infested tracts but

unfortunately they appear to be decidedly ineffective. Up to the present two or three different hymenopterous (wasp) parasites of the Green Bug have been bred out in Bangalore but in the infested area of Mysore up to the present not more than five percent of the Green Bugs in an infested estate have been found to be parasitized. Considering the rapid rate of increase of the Bug, this amount of parasitization is practically useless as a check on the Bug. In Bangalore as much as 25 or 30% of the Bugs on an infested coffee tree have been found to be parasitized and there seems to be some hope that parasites may be brought to prove more efficient checks to this pest in the dry season than they are at present.

With regard to predaceous enemies none has yet been found in Mysore although a diligent search extending over several months has been made for them. I have been given to understand that at least one predaceous enemy has been found in Green Bug infested areas in other parts of South India and a careful search for such enemies with the object of introducing them into Mysore and Coorg would be well worth the effort and expense involved. At this time I need hardly point out the fallacy of attempting to introduce predaceous insects irrespective of whether they have ever fed on Green Bug or closely related scale insects.

The question of the utilization of parasitic and predaceous checks for the Green Bug is, at present, receiving the attention of the Mysore Agricultural Department and preparations are already being made for extensive experiments in this connection. If it should prove possible to supplement the action of the fungus, which is such a valuable natural check during the monsoon, by parasitic and predaceous insects, which would take up the work during the dry season, we would have gone far towards making the Green Bug if not entirely innocuous at least of minor importance as a pest of coffee. Whether this can be accomplished is a question for the future to decide. In the meantime, a policy of indifference or neglect on the part of those coffee planters whose estates are already infested would be absolutely inexcusable for not only would it mean, in all probability, disaster to those particular estate owners but it would mean in addition an ever increasing source of danger to other planters who have up to the present, been so fortunate as to remain free from this serious pest.

LESLIE C. COLEMAN
Director of Agriculture in Mysore.

STRAITS SETTLEMENTS.

Rubber Exports during March, 1914.—The following figures of the exports of cultivated rubber from the Straits Settlements during the month of March, 1914, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for March, 1913, being added for purposes of comparison:—

	1913.	1914.
	Tons.	Tons.
March ..	898	1,285
January-March ...	2,425	4,169

These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra and the Non-Federated Malay States, but do not include rubber exports from the Federated Malay States.—*The Board of Trade Journal.*

INDIAN EMIGRATION TO JAMAICA

The latest annual Report of the Immigration Department in Jamaica, for the year ended 31st March, 1913, has just been received in India, and there is much interesting information to be gleaned from it. During the year the number of indentured immigrants was 1,985 and the number repatriated 331, making the total estimated East Indian population at the end of the year 20,000, of whom the number under indenture was 4,152. Of the 331 repatriated, 135 were granted free passages after 10 years' residence in the Colony, and 78 assisted passages, 95 were sent back as unfit for further service, eight were persons who were rejected on arrival, and 15 who paid their own passages. Thirty-three immigrants were released from indenture on the ground of ill-health, nine on the ground that they were useless as agricultural labourers, and nine commuted their indentures by money payments to employers in respect of the unexpired periods of the indentured service. No time-expired immigrant applied to enter into any contract for service in the island. "There has not been a single case of an immigrant re-indenturing himself during the 22 years I have been in this Department," says Mr. Doorly, the writer of the Report, from which fact, considered together with the fact that the proportion of Indians who return to India, is so small as it is, it may reasonably be inferred that the cooly who goes to Jamaica finds himself better off there than he would be in India. As a matter of fact, the immigrants who, after the expiration of their indentures, settle down in the Colony, and who form the larger, and are a growing section of the East Indian population, are well off, judging by other statistics which are given in the Report. As in the other Crown Colonies which import Indian indentured labour, they are generally cultivators, and a large number own property. Some are engaged in trade, and there are 356 retail shopkeepers and 82 dealers in spirits; 91 had gun licenses and six were licensed hawkers. Several also hold live-stock, valued at £10,167. We also gather that 1,411 immigrants had at their credit in the Government Savings Bank during the year under report £17.536, against £1,239 and £15,117, the corresponding figures for the preceding year, while many others made substantial remittances to India or brought the money back with them. In the matter of education, 453 boys and 272 girls were attending school out of 915 boys and 920 girls of school age within reach of school. The number of the immigrants undergoing imprisonment on the 31st March, 1913, was small. The Protector of Immigrants reports a considerable reduction in the percentage of cases brought against indentured immigrants for breaches of the Immigration Laws.

We have received the important matter of work and wages for the last. A detailed statement is attached to the Report in which are shown the average earnings of indentured immigrants on each estate in the Colony, and the weekly average for the whole island works out as follows for 1912-13 :— Men, 6*s.* 4½*d.*; women, 5*s.* A new law which was passed during the year, ammending the immigration Protection and Regulation Law, 1879, provides as follows :—"No rate of task work for immigrants indentured after the coming into operation of this law shall be approved unless it is sufficient to afford to an able-bodied trained male of 18 years of age or upwards at least 1*s.* 6*d.* a day for a fair day's work of nine hours with ordinary exertion, and more with extraordinary exertion. Although this enactment applies only to immigrants introduced after the passing of the Law, the Protector of Immigrants declares that "it is certain that it will also have the effect of increasing the earning capacity of immigrants already in the island."—*Indian Planters' Gazette.*

MOTHERHOOD AND INFANCY AMONG ESTATE COOLIES.

By

AYLMER MARTIN.

I.

Being on leave, I put forward this paper purely in my private capacity, quite apart from my present or any future billet. I discuss the subject because of its universal interest, and not because I desire to impose my views on anyone. I would like to awaken interest in all who have not yet given it thought, and anything I say by way of suggestion is intended to be of assistance to those who have a desire to tackle the labour problem in all its aspects.

All planters must have had to face the difficulty of how to deal with infants in arms and their mothers, and with pregnant women who happen to be near their time on plantations. The method of treating them varies on different estates in each district, ranging from no consideration at all, to what the Proprietors and Managers may think to be the limit possible for financial or other reasons. In trying to arrive at a knowledge of all the causes which contribute to the labour difficulty, I have had talks with many Indian people, and I am bound to say they were not very helpful, grievances brought forward being often unreal and suggestions quite impracticable. Some time ago, I was struck by the remarks of a man whose natural character and education rendered him fit to declare his mind with intelligence, and I think he knew that I was genuinely anxious to do what I could to deal with real drawbacks to which coolies are subject when employed on plantations. His remarks confirmed my own opinion that infant mortality on estates was more than it need be, but he also told me what at the time was new to me, that it was considered so among the coolies themselves. Mothers who brought small children away from their villages, went back without them, carrying only the sad news of the death of their little ones. It is considered also that infants born on estates have a poor chance of surviving. My own experience now agreed with this, and I therefore think our coolies have in this matter a genuine cause for dissatisfaction with the conditions of their life on estates. To the cooly classes, apart from questions of natural affection and sentiment, children are the greatest asset they possess. Not only do children become breadwinners at an extraordinarily early age, and literally help to keep the pot boiling for the whole family, but they are looked upon as a provision for the parents' old age, an insurance against the time when the old couple are beyond work. In India, to give credit where credit is due this point of view is justified. Parents of all castes, including Brahmins, expect a return from their children; not to do so would be considered unnatural, and their sons and daughters, in the vast majority of cases, respond with a touching devotion.

However much we may want to discourage the arrival on our estates of pregnant women and nursing mothers who are not in a position to do hard work, in the struggle for labour we can no longer pick and choose. It is often impossible with a gang of coolies, to arrange for these to be left behind. Rather than adopt such a course, the whole gang would refuse to move. Labour is not so plentiful that we can dictate our terms in such a matter. We must make the best of a bad bargain, and try to turn a difficulty of the present, into a blessing for our sucessore in the future. I look upon it as a settled condition of affairs which we have to face, that on every estate of

reasonably large dimensions, unless it is exceptionally situated, there will always be some women with infants in arms, some with children too young to be left to take care of themselves, and some in that condition "in which all women love to be, who dearly love their lords."

At our present state of evolution, it is not possible to attain the ideal. We cannot go so far in Socialism as H. G. Wells, who, in "New Words for Old" says "A State that undertakes to sustain all the children born into it, will do its best to secure good births." We cannot bar the reproduction of the halt, the blind, the weak, etc., but I think it is possible to find a practical way to improve upon the present state of affairs on most estates in S. India, where indeed so little is being done, that improvement is easy.

The cooly woman is hardy beyond all expectation we all know, and some children do survive under conditions which are almost beyond belief, we also know. It may not be necessary to do very much, but enough can be done to remove from the coolies' minds the impression which now,—as I believe justly—exists. In considering the matter, it must be remembered that we are all alive actually and even have legal rights, many months before we are born. The nourishment and care of the expectant mother some little time previous to the birth of her child should therefore be considered, also her nourishment and care for some time afterwards, and finally the treatment of infants and children according to their age and physical qualities.

To deal first with pregnancy. No Indian woman is averse to declaring her condition quite early in the state, when it is legitimate. Both husband and wife are proud of it, and it is joyful news to all the neighbours. But the subject acquires some delicacy when it is illegitimate. To induce a young girl to declare her pregnancy under these conditions must always be difficult. Yet these are the very cases that demand our care more than all others. It is with them we would like to have the earliest intimation, for it is in the early stages the girl is despondent, frightened of the consequences, and perhaps despairing. It is then that it can be safely concealed and safely got rid of. When concealment is no longer possible, she will generally have become reconciled to her fate, but even if this is so, she thinks a dead child may be forgotten while the live one is always in evidence against her, and so the result is the same.

No very great knowledge of the social rules and customs of the various castes from which our coolies are drawn is necessary. Amongst them, what constitutes a marriage or a divorce? What is considered a regular intimacy and what is irregular? In a country where concubinage is recognised so liberally as in India, and where marriage ties are so loose, I confess I often find it quite impossible to draw the line between conventional morality, mere amorallity, and immorality.

As a general rule, what is open and well-known is all right (though even here avoidance of childbirth may exist) and what is more or less clandestine, is illegitimate. I say "more or less" advisedly, because a few people are generally in the know and others pretend not to know, in case it might be subsequently brought up that they approved.

(*To be continued*).

How the German Government regard Agriculture—"Agriculture is the mother of a nation's strength, which industry employs; agriculture represents the broad acres in which the trees of industry and commerce are planted and from which they derive their nourishment."—Prince BUELOW.

RUBBER.

International Rubber Exhibition.

On June 24 next an International Exhibtion of rubber and rubber goods and of cotton and other fibres and tropical products used in connection with their manufacture will be opened at their Agricultural Hall, Islington by His Royal Highness Prince Arthur of Connaught. His Majesty the King has graciously given his patronage to the exhibtion, which will be representative not only of the British Empire but of all other States and Countries having possesions in the rubber and cotton belt of the tropics and subtropics. The occasion will be one of much importance because, in addition to the exhibition proper, there will be a seven days' Congress of Government Representatives and manufacturers interested in rubber, fibre, and other tropical products.

Looking at the prospectus that has been prepared, it is not too much to say that the promoters of the enterprise have arranged a series of exhibits the completeness of which will do much to make the public understand the extent to which rubber enters into industries connected with civilisation. People hardly realise how much they are dependent upon this substance for the very common places of existence. Without it they could not have either the telegraph or the telephone; the electric light would be impossible, and the whole of the vast industries associated with electrical science would be non-existent. Yet within the memory of living man rubber was merely a curiosity, or used only in making a few trivial and unimportant articles. Now the whole trade and commerce of the nations would almost come to a standstill without it.

Its importance may be judged from the fact that no less than thirty-five British and foreign Governments will be officially represented and have exhibits in the exhibition. In addition hundreds of rubber growers and manufacturers in these countries will have their produce in the Agricultural Hall. The British Empire will be fully represented. Among the Colonies sending exhibits are British Malaya, Ceylon, Nigeria, British Guiana, the British West Indian Islands, India (excluding several native States), the Sudan, Egypt, British East Africa, Sierra Leone, Rhodesia, South Africa and British Borneo. France and all the French tropical and sub-tropical colonies will be represented, also Germany, Holland, Belgium, and the Congo, Java, Samoa, the Federal Government of Brazil and the provincial governments of that Republic, the United States of America, Portugese East Africa, the Hawaiian Island, the Phillippines, and many other lands.

At the Congress which is to constitute an important feature of the exhibition, scientists, chemists and manufacturers from all parts of Europe and America will discuss problems affecting the supply and utilisation of rubber. In the three years that have elapsed since the last Congress was held in London great advances have been made in our knowledge of the chemistry of rubber, and in its application to practical work, so that the members will have plenty of material for consideration.

Mr. L. Harcourt, M. P., Secretary of State for the Colonies, has promised to attend the Congress and deliver an address.

Features of the Exhibition.

In addition to rubber the exhibition is to include cotton and other fibres used in connection with the employment of rubber in industry, and also a section devoted to coconuts and the infinite variety of products derived from that fruit. A valuable adjunct to the exhibits will be found in the moving

pictures which will be used to illustrate the collection of rubber and the methods by which it is turned into the finished article. Planting, tapping the trees, gathering cotton and coconuts, and other phases of tropical industry will be shown. The public will, no doubt, appreciate the pictures all the more for the fact that the display will be free. The payment at the turnstiles ensures admittance to every department in the exhibition, and includes the right to the services of a special staff for supplying information to travellers, capitalists, manufacturers, and others seeking authentic details regarding the resources and prospects of the different countries.

A very useful series of official exhibits is being organised by the Rubbers Growers' Association, the British Cotton Growing Association, the Planters' Association of Antwerp, the Amsterdam Rubber Association, and the Rubber Club of America. Kindred Organisations are making similar arrangements, so that the exhibition is certain to be the most complete and instructive that has hitherto been held in connection with rubber and the allied indutries. There will be gathered under the roof of the Agricultural Hall, the products of many widely separated lands, whose representatives will be on the spot to inform the visitor on any point which may require elucidation. And, a boon on such occasions, no one will be asked to buy anything, as stands for the sale of articles are not to be permitted in the building. Programmes will be supplied free to all; there are to be no cloak-room fees, and club and reception room accommodation will be provided free of charge.

Some of the countries represented have secured as much as 12,000 square feet of space for the display of their products. Brazil will show about thirty tons of rubber, but the "plantation" countries in the Far East will have a much larger amount in the aggregate on view. Manufactures in Great Britain, America, and the Continent of Europe will be fully represented. Samples of every description of article into the composition of which rubber enters will be shown, and the public will be amazed to learn the extentent and variety of these. Among other things in this section there are to be shown rubber flooring, which is both pleasant, sanitary, silent, and durable, a rubber tennis court, a rubber skating rink, a rubber roadway, and hundreds of other uses to which the material can be put and for which many valuable prizes are offered.

Tropical Agriculture.

Tropical and sub-tropical agriculture generally will be brought before the visitor in a striking manner, both in its producing and manufacturing aspects. The Sudan, newest of agricultural countries, is showing the energy of youth by arranging for the exhibition of a miniature cotton plantation, with the plants in full bearing. America, Australia, Nigeria, and the West Indies will also exhibit rubber and cotton, as well as such typical products as coconuts, copra and coir, Sisal hemp, Manila hemp, tea, coffee, and other products of the tropical zone. Indeed it may be said that everything which the soil produces in hot climates will be there for inspection of the interested as well as of the merely curious. The machinery and appliances used in connection with the preparation and manufacture of these gifts of the sun and soil will be appropriately displayed.

The Exhibition is under the presidency of Sir Henry Blake, ex-Governor of Ceylon, the Bahamas, Newfoundland, Jamaica, and Hong-Kong, and the list of vice-presidents include such well-known names as those of the Earl of Selborne, the Earl of Denbigh, Viscount Kitchener, Lord Elphinstone, and Professor Wyndham Dunstan.—*The Daily Telegraph.*

CORRESPONDENCE.

Judicial Department,

No. 1188.

From

The Hon'ble Mr. A. Butterworth, I. C. S.,

Ag. Chief Secretary to the Government of Madras.

To

The Honorary Secretary,

United Planters' Association of Southern India,

Bangalore,

Dated Ootacamund, the 21st May, 1914.

Sir,—In reply to your letter of the 10th September, 1913, regarding delay in the execution of warrants issued against absconding maistries and coolies under the Madras Planters' Labour Act, I am directed to state that the District Magistrate, Coimbatore, has made careful enquiries as to the difficulties experienced in the execution of these warrants and as to whether better results would be obtained if non-bailable instead of bailable warrants were issued. The chief difficulties are:—

(1) that as the members of the Association are no doubt aware, wrong names and addresses are given by coolies with the express purpose of escaping detection, different names frequently being given on different estates;

(2) that it is frequently difficult to identify the person for whose arrest a warrant is issued owing to the existence of more than one person of the same name in the village to which the absconder goes;

(3) that in some cases warrants are first received with a direction that the agents or clerks of planters will appear to assist in tracing the absconding cooly, whereas they frequently fail to appear and warrants are accordingly returned unexecuted to the Court that issued them;

(4) that in some cases warrants are recalled by the issuing Magistrates before they have been executed, the reason sometimes being that the cooly has already returned to the estate of his own accord.

2. These reasons cannot, of course, be held to cover all cases of unexecuted warrants, and I am to assure the United Planters' Association that special attention will be paid in the Coimbatore district to securing execution in as many cases as possible.

3. As regards the question whether greater efficiency would be secured if non-bailable, instead of bailable warrants were issued, I am to say that the Government would not view with favour the increased issue of such warrants. In their opinion, besides disorganising the regular work of the police, the amount of escort work it would involve would be altogether disproportionate to the end to be attained. Police officers can at present insist on proper security under a bailable warrant and Magistrates can enforce the penalty in case of default.

I have the honour to be,

Sir,

Your most obedient Servant,

(Signed) ANANTARAMAIYAR,

For Chief Secretary.

Balur Estate,
Balur P, O.,
Kadur District.
23rd May, 1914.

Labour Commission.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—I have read the Hon'ble Mr. Baber's letter in your issue of the 16th inst. with some surprise. As a non-subscriber I have refrained from criticism of the labour scheme, leaving it to those who had joined, and I think more criticism would have been highly beneficial. The scheme is purely a business proposition, and when I ask myself what I am to get for my two rupees per acre, the only answer I can give is, practically nothing. For the life of me I cannot see what benefit Mysore will derive from the labour Commission without the support of law; which as Mysore is a Native State, and most of the labour comes from British territory; it will not get. I am in no way hostile, so long as I am freely allowed to go my own way, and Mr. Barber is wrong when he says, "those who are not with us are against us." My object now is not to criticize but to protest against Mr. Barber's attempt to turn the Labour Commission into a Trade Union, try to ruin those who do not belong to it. I have been told by three men during the last month, they joined the Commission under compulsion, as they had been told the Labour Commission would take away all their labour. Mr. Barber in his letter to Mr. Mead writes part of the propaganda would be to *prevent* Coolies going elsewhere, *i.e.*, to other than subscribing Estates. This confirms what I have been told. I can only say that, if non-subcribers find this being done, and their writers, Maistries, and Coolies are being induced not to return, their only course will be to use the two rupees per acre saved as non-subscribers, in raising the pay. The shareholders and Proprietors will not thank the Commission for this. It seems Mr. Barber's threat is intended to bring in more waverers.

Yours faithfully,
ERNEST LUND.

Peruvanthanam Estate,
Mundakayam, 23/5/14.

Labour Commission.

THE EDITOR,
The Planters' Chronicle.

Sir,—I do not wish to intrude into the discussion of the Labour Commission by my elders and betters, but must point out one error continually recurring in many letters and emphasised in Mr. Richardson's letter dated the 13th inst. "Why should Mr. Mead try to upset the camp of the MAJORITY which he refuses to join." The Ceylon P. L. F. demanded a majority of 80% for their scheme. The U. P. A. are content with 100,000 acres out of how many? I make it well over 220,000 planted acres, but would be glad of official figures.

Yours faithfully,
H. E. KIRK.

[The official figures of acreages given by the Delegates at the Annual General Meeting of 1913 were 147,947 acres. The Labour Commission asked for 100,000 acres to subscribe to start the Department, 85,000 acres have given their support: or 85% of 100,000 required.—ED.]

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Labour Barometer this week has risen to 86,429·41 acres. Three weeks only remain to force the mercury to its zenith. Every acre or degree added to the Barometer carries encouragement to those who still waver. Let us hope that during the last three weeks there will be a rush not to be last.

We print the proceedings of two District Associations—South Travancore and Anamalai Planters' Associations. The former Association decides not to support the Scheme as at present constituted and governed. By standing out they fail to see that they cut themselves adrift from all voice or vote in the future constitution and control. By joining they can at all events try and change both. The Anamalai Proceedings are short, but it is to be noted that area felled this year will join the Commission.

We publish the second instalment on Motherhood and Infancy among Estate Coolies from the pen of Mr. Aylmer Martin, which will be read with interest by all interested in the welfare of their labour force. But more interesting to us is the thought that one of our community in his hard won holiday still finds time to turn his thoughts Eastward to the land and industries which have given him employment.

Planters' Topics and the Indian Export of Bones is taken from the *Englishman* and is a question that has been freely discussed at the Annual Meetings and on which resolutions have been passed, but so far without much effect. But who knows? The mills of God (or the gods at Simla?) grind exceeding slow.

Green manuring in Tea is a subject of absorbing interest to all—not only to Tea Planters, but to all agriculturists and the article furnished to the *Indian Planters' Gazette* by Mr. Claud Bald is well worth reading.

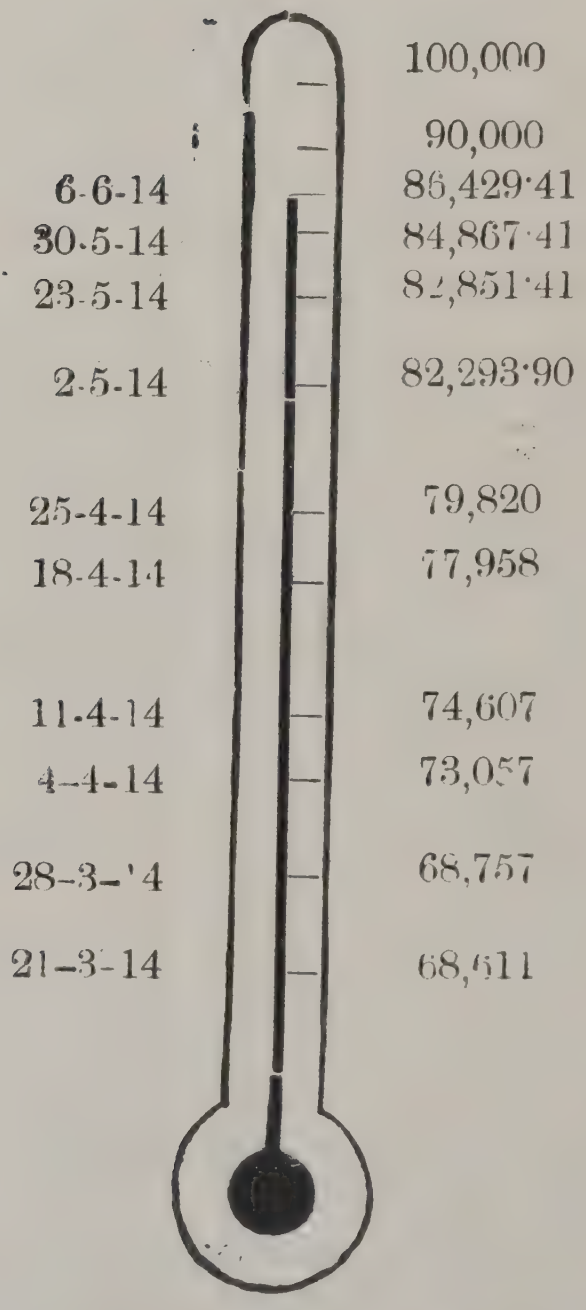
Our correspondence columns are taken up by Mr. Graham and an Enquirer who no doubt will receive replies. Mr. Mead writes again on the Labour Question, and we are always pleased to publish his letters.

It is not for us to enter into controversy with any of our correspondents but we felt constrained to make a rather long editorial note on Mr. Kirk's letter.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the General Meeting held at the Quilon Club, on Saturday, 23rd May, 1914, at 10-30 a.m.

PRESENT.—Mr. L. G. Knight (Chairman), Messrs. J. B. Cook, A. W. Leslie, L. M. Young, C. Hall, J. H. Parkinson, T. P. M. Alexander (Honorary Secretary), and J. Mackie (Visitor).

Confirm Minutes of Meeting.—Erratum of last meeting. The Sittar elephant shooting case. This should read "This was not brought up before the Assembly, as the case had been compounded on A. V. Cree paying a fine of Rs.100."

The minutes of the last meeting were taken as read as the minute book had been lost, but any questions which any one had to ask would be answered if possible.

Mr. Cook proposed and Mr. Leslie seconded "that the Hon. Secretary should write to the late Hon. Secretary asking for the minute book to be produced, and that this Association expresses its displeasure at the slackness of the late Hon. Secretary in forwarding the books."

Civil Court at Poonalur.—Proposed by Mr. Alexander and seconded by Mr. Parkinson "that His Highness' Government be respectfully approached in granting a Civil Court at Poonalur."

In consideration of the large acreage under Tea and Rubber cultivation in the vicinity of Poonalur, and the inconvenience of going to Adoor, which takes 2 days to get to, it is hoped that this Civil Court will be granted.

Telegraph Office at Vadaserikara.—As no interest has been shown by the members interested, in the district, *re.* the telegraph office at Vadaserikara, Mr. Knight proposed and Mr. Cook seconded that the matter be dropped.

Further discussion on the proposed Labour Commission.—This was fully discussed in Committee and the general opinion was that as at present constituted this Association does not see its way to support the scheme: though an amended scheme, differently governed might be favourably considered.—Carried.

Godowns at Poonalur and Tenmali Railway Stations.—Proposed by Mr. Alexander and seconded by Mr. Hall that the S. I. R. be approached in granting improved accommodation at Poonalur and Tenmali Stations.

Discussion on Game and Gun licence.—Discussion on this was left over till the following meeting:—

C. T. P. Association's resolution re. the appointment of a Planting Member, to be on the Committee of Lady Ampthill Nursing Institute.—It was proposed that our Bangalore Delegate talk over this matter with other Delegates at the meeting in Bangalore on July 6th.

Quilon European Ward.—Proposed by Mr. Cook and seconded by Mr. Leslie that as this was promised us by His Highness' Government, and then cancelled, the Honorary Secretary write to His Highness' Government, asking them to favourably reconsider their decision.

Election of a Delegate to go to Bangalore.—Mr. Cook was unanimously elected as the Delegate to represent this Association at Bangalore.

A letter was read from the Central Travancore P. A. proposing that an Annual Meeting of all Travancore P. A's be held. A resolution to this effect was passed at our last meeting in March, and this Association suggest Quilon as the most suitable and convenient meeting place and the Honorary Secretary was asked to communicate with other Associations on the subject.

A vote of thanks to the Chairman and Hon. Secretary closed the meeting.

(Signed). T. P. M. ALEXANDER,
Hony. Secretary.

The Anamalai Planters' Association.

Minutes of a Committee Meeting held at the Castlecroft Bungalow, at 2 p.m., on May 11th, 1914.

PRESENT,—Messrs. A. A. Robb, E. W. Simcock, S. Hatton-Robinson, R. Fowke and C. R. T. Congreve (Chairman).

Labour Commission.—It was decided to include the area felled this year in the acreage willing to join the Commission, and the Honorary Secretary was instructed to send the figures to the Hon'ble Mr. Barber and the Secretary of the U. P. A. S. I.

Township.—The Honorary Secretary was instructed to write to the Collector asking what steps Government were taking with reference to the hospital and township sites, as we understand that Government have decided to proceed with those works themselves.

District Board Representative. The Honorary Secretary was instructed to write to the Secretary to the Government Board of Revenue pointing out that as this District now pays large taxes to Government they consider they have the right to have a representative on the District Board, and requesting that orders may be passed to this effect.

Telegraph Office.—The Hon. Secretary was requested to write and find out what was being done in this connection, and when the Department were going to start laying down the wires to the District.

Coimbatore District Roads.—The Hon. Secretary was requested to write to the President of the District Board pointing out that the present state of the roads round Coimbatore was disgraceful (especially the main road from Coimbatore to Vananthorai) and that they have steadily deteriorated for the past 4 or 5 years, while apparently little or nothing has been done during this period to maintain them, in even moderate repairs, and that between Pollachi and Vananthorai no metal has been collected at all for the coming wet season. It was resolved, that if immediate steps were not taken to improve the condition of the roads, the matter be put before the U. P. A. S. I. at the next Annual General Meeting for the purpose of getting them to address Government direct on the matter.

(Signed) C. R. T. CONGREVE,
Chairman,

(„) J. E. SCOTT,
Honorary Secretary.

MOTHERHOOD AND INFANCY AMONG ESTATE COOLIES.

By
AYLMER MARTIN.

II.

I once took up the case of a Kangany who was well off, whose wife, whom he had loaded with jewellery, and on whom he had settled a couple of thousand rupees worth of property, left him and married a scoundrel. I could not bring the parties to terms and the matter was taken to the Courts. The Indian Magistrate before whom the case went in the first instance, held that there had been no marriage and therefore no criminal offence had been committed. The people were residents of the same town as myself, and as I was personally aware that the marriage had taken place, I informed the European Divisional Officer who had jurisdiction, that a miscarriage of justice had taken place. He took the case on his own file on appeal, and found that the ceremony performed with the woman by both men was marriage, but that according to the custom of that particular caste there was no criminal offence, as the woman was at liberty to chuck one husband when and where she liked, and without saying "by your leave" go and marry another. It is not, therefore, within our province to take up any moral standpoint in these matters; if we do, it is more likekly than not that we shall go wrong. That is an aspect of the subject which must be left to people who can make a life-long study of it, and who may find themselves in a position to deal with it. All we are concerned with is, that we want more coolies, and one way of increasing the future supply, is to attend to the breeding of them.

Actual experience of the peoples of the world, proves that immorality conduces to sterility and we should therefore discourage it by all means. On most, if not all, S. Indian Estates, coolies employed are in family parties and we cannot be reproached as countries employing Indian coolies across the sea have recently been. Fiji for instance where, owing to the insufficient number of women immigrant coolies are said to be living under conditions described as "the morals of a poultry yard." In Malaya also, the Government Officer in charge of immigration, notes with satisfaction the fact that in 1912 the proportion of women rose to 18 per cent. from 13 per cent. in 1907. These conditions cannot be considered as anything but scandalous, as they must lead to promiscuity or worse. Our own position in this respect is quite satisfactory. It is for us to take advantage of it. In common with all other communities on the face of the earth, illegitimacy does however occur, and we must make the best and not the worst of this fact. Children born and bred on the estate, make best labourers, they are accustomed to discipline all their lives, know no other life, and no other home than the estate. It is a well-known fact that the "love-child" is as a rule a finer specimen of the human animal than the child legitimately born. The outcome of an instinctive impulse that has proved beyond restraint, results in a stronger, healthier specimen of humanity than the child born of cooly parents chosen for each other by cooly standards and cooly judgment. I say all this to emphasise the point that we want to get early information of pregnancy from all women on the Estate. With the legitimate cases this is easy as I have said, but if we can help it we do not want to lose that finer specimen of the human animal, that stronger, healthier morsel of humanity, to be born and bred on the Estate, and to be turned into the best type of labourer we can get. Having secured his normal birth we do not want to neglect his welfare during infancy, his subsequent growth or general career.

Is all this looking too far ahead? Some may think so, but I am all for doing something—whatever we find possible—now, and not leave it open to our successors to reproach us, not for lack of foresight, but for the worse crime of knowing that we ought to do something, and not trying to do it.

First then we should show a practical interest in the pregnant women among our coolies, and show favour to those already in this happy condition. If they express a wish to leave the estate for the event, it is open to us to acquiesce, after expressing regret that the estate is not to be the privileged place of nativity. If a woman elects to remain on the estate, the work given to her during the last few months, may be lighter than what is expected from others. I know places where this rule is already in force and where a cooked meal a day is allowed free to those whose health is not quite up to the mark, but all that sort of thing has to be carefully done, for the husband may eat both shares in the evening if his wife has had a blow-out at estate expense at mid-day. As the time approaches, some little preparation the Estate may well make without interfering with prejudice. A present of sterilised silk which is quite cheap and a word of advice to use it instead of a filthy rag for tying the umbilical cord may be the means of saving the baby from tetanus or blood poisoning. An inspection of the room where the birth is to take place, an enquiry as to any alteration desired in the accommodation, a general clean up and so forth, will go far to prove our interest. Our wives if we are married, can attend to all these things better than ourselves perhaps, but on no account should the duty be entrusted to an unqualified subordinate. Indians with a medical training are qualified of course, but any sympathetic and tactful European is better than a native, and our ultimate object is sooner attained.

Cut off the foot of an old woollen stocking, topsew the cut edge of the leg part with wool to prevent ravelling, boil it well and after drying present it for the use of the little stranger; it can be drawn up over his chest and tummy to keep these vital parts warm. A few changes of the same sort of raiment may be given after birth. Refinements in the way of tape and ribbon for braces I have seen, but as the lungs of a tiny baby are very high up, I prefer some arrangement for fastening the stocking itself over the shoulders.

It would be a pity to accustom the child to too much luxury, and spoil its inherited hardihood, therefore nudity in fine warm weather is to be encouraged; but seeing that the climates of the country where plantations lie, and that of the villages from which our coolies come, is so very different—for instance Coimbatore and the Wynaad, or worse still the higher parts of the Nilgiris—some clothing must be allowed for children in cold and inclement weather. From the leg of a stocking to the tiny jersey is an easy and inexpensive step, and from that through various sizes, to adult jerseys and coats which can be paid for by those old enough to earn their own living. There are other ways in which our interest may be evinced. I have a beautiful snapshot of a baby-show on one estate kindly sent me by the Manager and I prize no picture more.

(To be continued).

UNITED STATES OF AMERICA.

Department (T. D. 34268) directs Collectors of Customs to assess duty upon paper twine at the rate of 25 per cent. *ad. valoram* (as manufacturers of paper) under paragraph 432 of the Tariff, unless a declaration of the shipper is attached to the invoice, and an affidavit is submitted by the importer, stating that the twine is to be used for the purposes mentioned in paragraph 650 of the Tariff and unless Collectors of Customs are satisfied that it is of a character which is chiefly used for such purposes.—*The Board of Trade Journal.*

PLANTERS' TOPICS.

Value of Bone Manure.

Prospective Industry in Surma Valley.

(From our own Correspondent).

Maulvie Bazaar, May 15.

A tea garden can do with as much rain as any other cultivation with which we are acquainted if it is well drained. The gardens in our district with few, if any, exceptions, are perfectly drained. An Upper Assam Planter when visiting the Balesera Valley a few years ago said that he had been in every tea-growing district of India, as well as in the principal ones of Ceylon, and had no hesitation in putting the gardens of our district in the very forefront of up-to-date well-managed concerns. He made special mention of the drainage which according to him was above all praise. On hearing the statement we grinned at the back of our heads as it were, because according to our certain knowledge there had been a period of several years during which the gardens were going to ruin and every manager and assistant knew it. The Directors did not appear to know and nobody appeared to think it. their business to enlighten them. However, all that is of the past. Perhaps if the Assam visitor had visited us during the black days he would have pitied us to the extent of keeping silence. A garden has its ups and downs. When it is down the Director's office, as a rule, is the place to look for the cause of it. As we are so well drained it takes a very abnormal quantity of rain to even temporarily stagnate our soil. Although we have been having excessive downfalls during the past two weeks the bushes show no signs of suffering from it. Some gardens have registered double the quantity of same date last year. The bushes look healthy and productive looking. With the exception of the red spider I hear of no pests giving cause for anxiety. Red spider we take as a thing of course. The weather is all that could be desired by any planter. It is hot, close and muggy with an atmosphere as near saturation point as we ever get it. We occasionally hear of a completely saturated atmosphere. Of course, this is wrong as we never have the atmosphere in such a state. If we had, evaporation would stop. The atmosphere is never in such a state as to be incapable of taking up more moisture. If it were it would have reached saturation point.

Indian Exports and Imports of Bones.

From time to time this subject crops up amongst planters and when the composition of bones is borne in mind, it does appear strange that they are not made more use of agriculturally. The application of bones to tea has not come up to expectations. In view of the fact that besides their containing about 23 per cent. of phosphoric acid they also contain about 4 per cent. of nitrogen, we would imagine that their application would be of great value for the sake of their nigtrogen contents alone. The explanation given by those who use them continually, is that they give out their properties slowly. Their effect is not so noticeable as a quicker acting nitrogenous manure as it is spread over a number of years, is conducive to a steady outturn, and is characterized by a sturdy, healthy growth, and is one of the factors on the telah which makes for quality in the manufactured tea. The same opinion is held concerning them by Home Agriculturists, and they continue to be more largely used than ever which no doubt is the cause of the increasing export from this country. Our soils are said to be richer in phosphoric acid than English soils, and do not so urgently require its addition. I think this idea would not hold good if anyone tried a few maunds upon an acre of his grazing ground and carefully noted the behaviour of the

cattle. If grazing ground is manured with farm-yard manure the cattle shun the manured place until such times as the grossness has been washed out or by reactions has been brought into a sweeter form. It is found to be different when the ground has been top dressed with a phosphatic manure if it has not been superphosphated. The latter causes too rank and quick growth of grass to enable it sufficient time to absorb other necessary elements which go towards quality, and the cattle appear to prefer a smaller quantity although procured by greater labour, when it possesses the true natural ratio required by their peculiar needs. Bone meal or bone dust has no rushing effect and its application has no deterrent effect upon cattle feeding on ground upon which it has been used. Its application upon grazing farms at Home is said to have a magical effect upon the quality of the milk. As the milk of a Home cow contains about 80 lbs., of Phosphate of Lime per annum it is not difficult to understand how grazing ground is benefited by its application. If soil can be depleted of its phosphoric acid by milk producing cows it no doubt can be so, although perhaps in a lesser degree, by any of the cultivated crops. We do know that sugarcane uses a large amount of phosphoric acid and a maund of tea removes, approximately, 1 lb. of this substance. This amount is small in comparison with the amount of nitrogen required by tea, and to judge by the large and continued use of oilcakes the latter element is in most demand by the soil in order to keep the tea bush going. There are gardens in the district, who have used no other manure for year, besides oilcake with an occasional green manuring. The latter is used as much for the sake of keeping the soil in condition by adding a supply of humus than with the object of contributing nitrogen, although a valuable additional supply of this would be also forthcoming. There never has been any noticeable sourness arising from this continuous application of organic matter. The bushes grow vigorously, producing an annual constant supply of leaf which shows up in the manufactured article equal to the highest average of the districts. It may be said that such a garden shows no want of phosphoric acid; still we have ample evidence that it is capable of improvement both in quantity and quality when a complete manure is used which contains phosphate of Lime. The tea bush does not appear to respond as quickly to bone dust as some other plants do. Although bone dust is said to be a slow acting manure, it certainly shows the effects of an application upon many plants in two weeks, and we consider that fairly rapid action. That the tea bush does make use of phosphorus when supplied is shown very clearly by the way in which it responds to its application in a soluble form as superphosphate, when its nitrogen can have no effect. The application of phosphoric acid in the form of superphosphate has not much to commend it unless supplied as a renovation in the treatment of deteriorated tea. It has also been found of advantage as a constituent of quickly acting complete manures when used in cases of damage by hail, red spider or any of the pests that weaken the bush by destroying the functions of the leaf. It assists greatly in the rapid formation of leaf and the sooner a bush recovers its leaves after a period of trouble the sooner it will require its normal vigour.

Prospective Bone Industry in the Surma Valley.

There are plenty of bones produced annually in the Surma Valley to keep a fairly large bone mill in constant activity. It has been suggested in years gone by to erect a mill at Shreemongal. The idea was scouted. The inhabitants of Shreemongal appeared to think they had vile smells enough in the shape of Government "Billy Stinks" without adding further abominations, and we quite agree with them. There could be no such ob-

jections, to having a tug and a barge containing an engine and boiler and bone mill. The rivers of the Surma Valley could have collecting stations and agents at frequent intervals, and the tug could take the barge from place to place and could keep grinding and shipping the product continually. This would be a better plan than having a mill erected on the railway. There might be agencies settled on all the river creeks and as all these creeks pass directly through the large "howars" where the bulk of the bones is to be obtained the agencies would be in touch with the whole country. For instance, an agent stationed at the mouth of the Belass where it joins the Barak river would be able to collect every bone in the Balesera Valley for six annas per maund. Such a concern would not confine itself solely to the production of manure. There are many other commercial uses to which certain qualities of bones could, perhaps, be more profitably put. Then, again, the gelatine could be extracted before being crushed. This product itself would more than pay half the cost of collecting and grinding, besides increasing the value of the phosphate by making it a more soluble manure without the disadvantage of its having an acid content. It would approach the quantity of a bi-calcic phosphate. This is the state to which the bone slowly progresses in a natural manner when added to the soil without any artificial preparation. It is the state to which a certain percentage of superphosphate reverts when kept in stock. As the value of such a manure is sold on its units of soluble phosphate the buyer gains greatly by buying a superphosphate that has reverted to a state which is considered by practical agriculturists to be more valuable than the mono-calcic phosphate which acts too quickly, usually characterized by a quick, rushing, but weak and spindly growth. The rules regarding the sale of such manures require overhauling and readjusting.—*The Englishman.*

Russia.

The following information is form the report by H. M. Consul at Batoum (Mr. P. Stevens) on the trade of that district in 1913, which will shortly be issued :—

Tea Cultivation.—The local tea industry made certain progress during the past year. Several acres of land were added to the area already under tea on the property belonging to the Imperial Domains at Tchakva, The tea crop of 1914 was fairly good ; the yield of raw leaf was 1,300,000 Russian lbs. (about 526 tons), and the quantity of tea manufactured was 300,000 Russian lbs. (about 121 tons). Tea growing is being generally taken up in the district by individual enterprise, and the Agricultural Society at Batoum has decided to construct a tea factory just outside the town to which tea, grown in the surrounding districts, will be brought for curing, *viz.*, withering, rolling oxidising and firing. Plants and seed are being widely distributed in the tea-growing zone, and a sum of 15,000 roubles (£1,589) has been granted by the National Government to be expended in 1914 on construction work in connection with the factory referred to. Further sums will doubtless be forthcoming as progress is made with the building. Government initiative has also gone so far as to assign the funds necessary for a tea factory at Ozurgeti (see "Board of Trade Journal" of 9th October, 1913, p. 751). The building is in course of construction, and an instructor, with knowledge and experience gained in tea growing on the Appanage estates at Tchakva, has been appointed to manage the factory and to enlighten the rural population in the art of cultivating tea.—*The Board of Trade Journal.*

TEA.

Green manuring on Tea Estates.

By Claud Bald.

Manager, Tukvar Co., Ltd., Darjeeling.

The question of manuring is now receiving a good deal of attention on many tea estates in North India, and if labour should by any means become more plentiful than at present, the use of manures is sure to be very largely extended. The only consideration which hinders many managers from expanding in this direction is that the labour at present available is hardly sufficient to maintain proper cultivation under ordinary circumstances without the addition of the special staff necessary, not only for application of manures, but also for dealing with the increased growth of weeds, which is the first result, of any manurial application. Green manuring is a branch of the subject which deserves very special consideration ; because it is much cheaper than artificial or chemical manures ; it takes less labour for a given result, and it is more permanent in its results. It is slower in its effects than a complete chemical manure ; but it is safer, in that it does not provide an artificial stimulus which tends in some instances to soil deterioration.

The Scientific Department of the Indian Tea Association has from time to time invited attention to this subject, by the issue of pamphlets and papers on green manuring. Dr. H. H. Mann wrote a particularly useful monograph in this connection in 1906, and in the same year he wrote a very informing article in the *Agricultural Journal of India* Vol. 1, Part. 2, in which special reference was made to green manuring.

It is not many years since green manuring was taken to mean only the ploughing in or hoeing of green stuff into the ground, with a view to fertilizing the soil for a crop to follow. Now, however, the expression has a wider signification, and is taken to mean also the planting of shrubs and trees, to act as perennial fertilizers amongst the particular crop which is cultivated. It is now very generally known by agriculturists that all leguminous plants, trees and shrubs, *viz.*, those which carry their seeds in pods, have the faculty of fostering upon their roots certain bacteria, which by their activities absorb free nitrogen from the surrounding atmosphere, and transform it into a fixed condition, in which form it is readily available for the support of plant life. It has been demonstrated that the special usefulness of certain crops of green manuring, and the fertilizing properties of leguminous plants and trees, are directly traceable to the presence of these bacteria upon their roots. This is a phase of the subject of green manuring which has hardly received more than a passing attention from many of those who are directly interested in tea planting. Just how the activities of those bacteria can be stimulated and encouraged, and the relative readiness with which they may be expected to seize upon the various leguminous plants grown upon the different tea soils, must of necessity be a study of great importance to such planters as are anxious to adopt the best methods, and to reap the best results from their daily labours, or from their investments in tea properties. Although the study of soil bacteriology is still only in its infancy, there has already been collated quite an array of established facts which must be of immense importance to all agriculturists. New facts are constantly being brought to light in this interesting study. All the latest works on every branch of scientific agriculture have much to say upon the activities of bacteria, both in regard to the formation and the fertilization of soils.

The form assumed by the root-nodules in which bacteria are found is different in the case of different plants, although the spherical form is the most common. Plate XVI. Fig. 1, illustrates the shape of full grown nodules upon a young plant of *boga medeloa* (*Tephrosia candida*), although the plant was only four months old from seed. An interesting fact in connection with this is that in the early stages the nodules upon the roots of this plant are always spherical. They become elongated into egg shape as they approach maturity. Some plants carry the nodules in the form of clusters of small individuals, as in the case of *Siris* (*Albizzia stipulata*,) shown in Fig. 2, or in clusters of larger individuals, as on the roots of full grown specimen of *boga medeloa*. shown in Fig. 3; while in some instances, as in the illustration of *moshymdal*, Fig. 4, and *dhaincha* (*Sesbania aculeata*), Fig. 5, in Plate XVII, many of the nodules tend to become anástomosed, or run into one another especially when the plant is grown upon land which has been enriched by manure or an accumulation of organic matter.

It has been stated that very vigorous growth above ground, and any special enrichment of the soil with manure or mulch, is against the formation of nodules upon the roots; but this is not the experience of the present writer; quite the reverse. The bacteria seem to revel in a comparative abundance of organic or nitrogenous material in the soil, and multiply with remarkable rapidity. The experience of many observant tea planters is that a crop sown for green manuring is more effective the second year than the first year of application.

In the selection of the particular kind of plants or trees for green manuring upon a tea estate, there are many important actors to be considered, and it is a want a sufficient consideration of these points which has caused some planters to arrive at the conclusion that green manuring on their particular estates is of no practical use. It is necessary to find out the particular variety which suits the particular soil. There are many kinds to choose from, as India is very well off in having a large catalogue of leguminosae indigenous to the country. There is the important fact that the tea plant is permanently in the soil; and in growing any plant or tree between the lines of tea bushes there is to be considered the question of action and re-action of shade from both sides. There are many kinds of leguminous trees which might prove very good nitrogen fixers, but the shade of their foliage is altogether too dense for the health of the tea bushes. On the other hand, there are leguminous plants which grow splendidly upon open ground in certain climates, but they languish when sown under the partial shade of tea bushes. Climate and altitude have also a great deal to do with success or otherwise of measures of this kind. Some plants grow well in every respect upon one portion of an estate, while upon another portion they completely fail. The reason probably is in a difference of tilth in the soil. A very stiff soil is generally unsuitable for an annual crop of leguminous plants, unless treated with a dressing of something like farmyard manure or castor meal.

The planting of suitable leguminous trees amongst the tea is the ideal method of green manuring: because when once done the result is permanent, and the nodules are formed upon the roots regularly every year, as these roots extend their ramifications, and they provide a new supply of nitrogen for the use of the tea bushes continually. The tree most in favour on tea estates is the *kala siris* (*Albizzia stipulata*), as it is hardy, and it's very light foliage does not seriously shade the tea in the growing season. On some of the estates in Assam and the Dooars other varieties of the Albizzia

are more in favour, also one or two varieties of Dalbergia, because of their leaves being more persistent in the dry season. Whatever kind of tree is used, it is quite necessary to pollard or lop the branches more or less at certain seasons of the year, in order to let sufficient light and air to the tea plants. The green stuff from the loppings is exceedingly valuable as a mulch for the tea. The only drawback to the use of trees for green manuring is the length of time which must elapse before perceptible benefit can be obtained.

There are several kinds of leguminous shrubs which grow rapidly, and give a good return within two or three years. The most useful of these in North India is the *boga medeloa* (*Thephrosia candida*). This is rather a handsome shrub, and when in full flower in the autumn, with a mass of white blossoms like sweet peas, it presents an interesting sight. It is a most valuable plant for green manuring, as it can be grown on any kind of soil, and seems even to thrive best upon poor dry land where other green manuring plants can hardly be got to grow at all. An important fact also is that the bacteria are attracted to this plant most readily, as the nodules begin forming upon the roots by the time that the plant is but six inches high. The usual custom is to sow the seed at the time of the early rains, in every second line between the rows of tea, a few seeds being sown in a cluster in the centre of the space between each four bushes; then covered lightly with soil, and protected by a tripod of short stakes. A better plan is to sow in a drill right along the line, about three inches apart, and thin out as the plants get up and prove to be too close, until they are about four feet, or eight feet, apart in the alternate lines. The plant must be kept lopped at intervals, so as to avoid giving too much shade to the tea bushes. This can be done three times a year, and the greeen stuff lopped off is about 90 to 100 maunds per acre at each lopping, when the plants are growing at a distance of 8 by 4 feet. This proves a very valuable mulch, the organic matter alone representing an important contribution to the soil, irrespective of its richness in nitrogen, and the store of nitrogen added underground.

It is customary to allow the *boga medeloa* to grow for about three years, and then uproot it, and trench all into the ground at the time of deep digging.

A still more rapid result can be had by sowing an annual crop between the lines of tea bushes. There are several varieties of crops commonly grown in North India which have proved more or less suitable for this purpose. Foremost amongst these is the *mati katai* (*Phaseolus Mungo, or P. aconitifolius*). In North Bengal it is commonly called *kalai dal*. This is largely used on tea estates in Assam, and on the lower slope of some tea gardens in Darjeeling and Dooars; but it does not grow well at any altitude above 1,000 feet. There are about a dozen different varieties of *Dal* and Soy Bean in cultivation on the hills. Most Darjeeling planters prefer the soy bean, commonly called *bhot mas*, for sowing amongst the tea; but it is doubtful whether the most suitable variety has yet come into general use. The principal objection to most varieties is their twining habits, and the consequent damage which they do to many of the tender new shoots on tea which has been heavily pruned. A plant which has proved particularly useful for almost any elevation is the *moshym dal* (Fig. 4.). It is hardy, and stands the shade of the bushes fairly well, and the foliage of it is not so troublesome to the tea branches as most of the other sorts. The *Barmelli bhot mas* is partially erect growing, and a very suitable kind for green manuring. *Nepauli bhot mas* grows quite erect (Plate XVII. Figs 6 and 7), and is suitable for high elevations, but does not grow

well upon very poor soil. The nodules which are shown upon the roots of this plant in the illustration are typical of the several varieties of Soy Bean and Dal. *Dhaincha* (*Sesbania aculeata*) shown in Fig. 5, is a plant which has proved very useful in some estates, and deserves to have a larger vogue. It grows erect, to a height of eight or ten feet; but is generally lopped at intervals, in order to keep it from giving too much shade to the tea. It is not an edible plant. *Arhardal* (*Cajanus indicus*) is an erect growing variety of *Dal* and at one time a good deal was expected from it; but in practice it has not proved so satisfactory as had been expected.

In the selection and cultivation of annual crops for the purpose of green manuring there are one or two facts of great practical importance. There is generally a direct ratio between the amount of growth developed above ground and the volume of nodules upon the roots. A crop which is sown early, provided that the conditions are favourable for growth, produces a much more abundant growth of green stuff than the same crop sown at a comparatively late season. Native farmers, who grow such crops for the resulting grain, sow rather late in the season, in July or August, as they know that the early sowings give too much green stuff and very little grain. The best time to sow for green manuring is whenever good spring rain has fallen; only that it is to be remembered that the crop will not grow at all until the ground is wet to a depth of at least six inches. In some cases it is possible to sow in April, in others where the climate is naturally dry it is not possible to sow successfully till the middle of May or June. The seed is sown in the rows between the tea bushes, after the soil has been dug over, and is lightly covered over with soil after sowing. In some cases the seed is broad casted, but with the bigger and stronger varieties it is advisable to sow in a drill down the centre of the space. About 40lbs. of seed to an acre is ample. In the case of the smaller classes of seeds there will be more plants, while the larger seeds give larger plants; but the weight per acre works out about the same. Sowing may be made in every line, and the coolies be allowed to tread freely upon the growing plants when plucking the tea leaves, as the light treading with bare feet does no harm to the young *dal*. In the case of twining or trailing varieties a little labour has to be spent upon training the young plants as soon as they begin to climb over the tea bushes. The plants are carefully pulled off and laid along the ground. Children or old women do this quite quickly, and the cost is not great. When lying along the ground many of the stems are induced to send out adventitious roots; and the writer has frequently seen stems of *moshym dal* fixed to the ground in this way for a distance of as much as two and three feet, with clusters of roots at intervals of two or three inches the whole way along the stem, and six inches deep in the gronnd; each cluster of roots having a complete set of bacterial nodules attached.

The length of time which should elapse before the crop is cut or dug into the ground varies in different circumstances; but is usually about six to eight weeks, and about two weeks longer on the hills. A good rule is that the crop has reached its maximum of usefulness when the plants begin to flower. On level country it is then hoed into the land; but on step hillsides, where it would be nothing short of madness to dig during the rains, the crop is merely sickled and left upon the ground as a mulch, till the time has arrived for the autumn deep cultivation. No planter need be afraid of losing much by sickling instead of digging in such circumstances. A little of the nitrogen will certainly go off into the atmosphere from the green stuff during the process of drying; but the principal benefit is already in the soil, as has been proved by scientific analysis, and by practical experiment.

Dr. Mann has stated that green manuring may be expected to yield an increase of about sixty pounds of tea per acre. This is quite a moderate estimate. By actual experiment the writer has noted an increase of fully 70 lbs. of tea per acre on a hill estate, at an elevation of 4,000 feet, and the increase on plains estates must be considerably more.

The failure or partial failure, of some tea estates to reap definite benefit from green manuring may be due to several causes. The kind of crop selected may not have been suitable for the particular climate or soil, and some other variety might be found more successful. The cover of tea bushes may have been too dense for any crop to grow through. In such cases the only time when green manuring can be successful is immediately after heavy pruning. A partial failure is sometimes caused by quite a sordid fact. The *dal* which is used for seed is a palatable and nourishing diet for the cooly, and if supervision is not very keen the cooly carries away in some recess of his clothing a considerable portion of the grain which he is supposed to have sown upon the ground, with quite a natural result. In order to checkmate conduct like this it has been found effective to steep overnight the seed for each day's sowing in liquid manure. Not cow manure, as a Hindoo would never consider that any contamination, but in horse or goat manure. The liquid manure assists germination of the seed, while it ensures that the seed will be duly sown. *The Agricultural Journal of India, April*, 1914.

(We are not in a position to reproduce the plates referred to in the article.—Ed., I. P. G.).—*Indian Planters' Gazette.*

From an interesting little booklet issued by the Kolar Gold Field Mining Board, we learn that for the 33 years, ended 31st December last, some 11,767,433 tons of quartz have been crushed yielding 10,311,484 ozs. of bar gold valued at £40,285,894. The shareholders in the Mining Companies have received £15,954,462 in dividends and the Mysore Government £2,068,258 as royalty, etc. At present six companies are at work with a capital of £2,081,000, the market price of which is £5,806,728. The area of mining operations 11,852 acres and there are 500 Europeans, 400 Anglo-Indians and 26,000 Indians employed, making with their families a population of about 50,000. The Mysore Government do not seem to have had altogether the best of the deal; but thereby hangs a tale, that we may unfold on some future day.—*Capital.*

Following are the particulars of Indian Coal production during the last three years, the figures for 1913 having just been supplied to us by the Chief Inspector of Mines in advance of his Annual Report :—

	1911. Tons.	1912. Tons.	1913. Tons.
Bengal ...	11,468,904	4,306,129	4,649,852
Bihar and Orissa ...	—	9,123,437	10,226,389
Punjab ...	30,575	38,409	51,040
Central Provinces ...	211,616	233,996	235,651
Eastern Bengal and Assam...	294,893	—	—
Assam ...	—	296,615	270,634
Baluchistan ...	42,598	45,732	52,932
N.-W. Frontier Province ...	140	50	90
Total ...	12,048,726	14,044,363	15,486,318

Cheer-o!

—*Capital.*

CORRESPONDENCE.

Hallery,
Mercara P. & T. O.,
N. Coorg.
May 26th, 1914.

Purchasing Potash Manures in England.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—I have read Mr. Birnie's letter with interest and, as I am probably one of the Planters he refers to, shall be glad if he can tell us if the terms on which the Kalisyndikate produce is sold in India are in his opinion fair ones, and such as the Syndikate would approve of if they knew. I still imagine that I can get it cheaper from home direct even after paying the English Agency and the middle man's profits that he refers to. I cannot lay my hands on the figures at the moment.

Anyhow any planter can ask his London agent what it will cost him to import and judge, from the replies he receives, for himself. "Nemo" also in his letter opens an interesting question. I do not know the present price of Nitrate of Potash, I mean the Calcutta quotations for the highest refractions.

Yours faithfully,
JOHN A. GRAHAM.

Nilgiris, May 28th, 1914.

Painting Coffee Trees.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—In your issue of May 23rd Vol. IX No. 21 page 309 it states "Painting of tar and crude oil emulsion (half and half) round the stem of coffee trees keeps away ants."

Would one of your readers who have tried the above, tell me through your medium, whether the tar is boiled or not before use.

Yours faithfully,
ENQUIRER.

Palapilly P.O.,
June 1st, 1914.

Labour Commission.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—I suppose it was inevitable that my last letter on the Labour question in your issue of May the 2nd should draw further correspondence on the subject. I had however hoped that I should not have been compelled to further inflict my views on your readers. But Mr. Barber's suggestion

that I obtained my South Canara labour by the methods proposed by the Commission to assist recruitment and Mr. Richardson's somewhat hysterical letter compels me to do so.

With regard to my South Canara connection (which is after all only 600 strong) it will interest Mr. Barber and possibly Mysore Planters to know that of the two maistries I employ, one was handed over to me by his last employer and the second had never been a maistry before and was introduced by my own man, both being financed by a landowner in South Canara. Incidentally I might mention that the first man had not worked in Mysore for ten years or more.

Mr. Barber's Ooty and Mr. Martin's Bangalore utterances are on record and the man in the street is quite capable of judging whether they were made for electioneering purposes or not.

It is perfectly true that I enquired about the possibility of joining the Labour Commission with part of my acreage, the idea being that as an acre came into bearing (and employed permanent labour) it might be worth subscribing. This is absolutely consistent with my previous suggestion that the Commission should be financed by a graduated cess on crops. The object in both cases being to secure some measure of fairness in the incidence of taxation. I did not think for a minute however that the idea would commend itself to the protagonists of the Commission.

With Mr. Barber I am all for securing exact date and general information and I can think of nothing which would better advertise the advantages of the Commission to waverers than the authentic publication of the advances per acre and per head for the last ten years of the K. D. H. P. Coy. and of the 12 estates that are included in Mr. Richardson's agency.

I regret that I have never been able to bring myself to believe that Messrs. James Finlay and Mr. Richardson have been solely influenced by an uncontrollable wave of philanthropic emotion in advocating a Central Commission. It seems to me more probable that they consider the Central Commission will do away with the competition between the three existing Tinnevelly agencies and reduce the cost of working.

With regard to the conclusion I have arrived at and published as to the competition between tea and coffee and rubber and coffee, it is based on absolutely incontrovertible economic facts. For Heaven's sake let us face the question as it is even at the risk of wounding others susceptibilities. No one should know better than Messrs. Barber and Richardson that when rubber is fully developed it will employ one tapping cooly for from 6 to 8 acres, that weeding costs will be negligible and that since cultivation to be successful must be done at certain seasons rubber planters will not employ heavily advanced labour for this work for whom employment could not be found at other times of the year. Tea on the other hand is a greedy cultivation as far as labour is concerned and will be more so when high cultivation is the rule rather than the exception. In Peermade this era has only been postponed owing to transport difficulties which Mr. Richardson's foresight and energy will I hope soon do away with. It is silly nonsense to suppose that tea planters (or any other planters) will refuse to employ the labour most suited to their needs.

When last in Ceylon I had the pleasure of seeing a "tundu" for 104 coolies with the very reasonable advance of 17,000 odd rupees. This should convince the "waverer" whether an effectively run Commission is capable or not of restricting advances *per se*.

Mr. Richardson is perfectly convinced that he had convicted me of inconsistency with regard to the comparative strength of a Central or District Commission. The cultivated area interested in West Coast Labour is very large. It is conceivable that a low acreage cess might produce more supporters and that a West Coast agency might be more powerful than a branch of a Central Commission could ever hope to be.

In my suggestion of a West Coast Agency I omitted Nilgiris, Anamalais, and Wynaad simply because at present these districts are not mainly dependent on the West Coast for labour. Any estate in any district that promised to employ this labour would naturally be able to join and use the Agency.

Referring once more to Mr. Richardson's letter, I can only add that if a scheme cannot withstand public criticism its promoters must feel doubtful themselves of its utility to the *general public*.

It seems to me that there has been too much haste in formulating the scheme, too much assertion of its advantages and too little data supplied to the man on the fence. To obtain universal support or nearly universal support, there must be no suspicion that contributors are paying out of proportion for the services rendered.

I absolutely agree with what Mr. Lund writes, the "big stick" and the inspired paragraphs on West Coast emigration are electioneering methods designed to fetch the waverer off the fence.

I am yours, etc.,

A. H. MEAD.

2nd June, 1914.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Sir.—In your Editorial comment on my letter of the 23rd ultimo, you rather juggle with figures, and leave the casual reader with the impression that the Labour Commission is going to obtain an 85% majority before going through. The Official figures now given by you show that 147,947 acres are attached to the U. P. A., and out of this acreage 85,000 acres are in favour of the Commission which is say 58%, a majority as Mr. Richardson has stated.

But how many acres do not belong to the U. P. A., but still employ labour and come into competition with us? From the Lawrence Asylum Almanac, I understand that quite another 70,000 acres are cultivated and employing labour, over the official figures. So the Commission will be content with 39% minority vote.

Yours faithfully,

H. B. KIRK.

[We published Mr. Kirk's letter as a good example of the way in which a plain statement is distorted to meet his views, and matter and figures imported which have nothing to do with the question. Mr. Kirk asked for the official figures of the acreage borne on the Association Roll. This was given as 147,947 acres.

To start the Labour Department, the Executive Committee, nominated by the U. P. A., after months of intense application and close scrutiny of ways and means, decided that *not less* than 100,000 acres were required to support the scheme, at 2 Rs. an acre—a decision that was unanimously adopted by the Delegates at the Extraordinary General Meeting on March 11th & 12th, 1914.

The Executive Committee was fully aware that 147,947 acres subscribed to the U. P. A., but decided that 100,000 acres at 2 Rs. an acre would be sufficient to start the Labour Department on. If the remaining 47,947 acres decided to support the scheme, so much the better, for the success of the scheme would be assured and the rate of subscription would consequently decrease. How wise the Executive Committee was to limit their demand to 100,000 acres is shown by the event. Of the required 100,000 acres 86,429 acres have given their support to the scheme which we maintain is nearly 86½% of the required acreage. No matter what other figures are brought into the question by Mr. Kirk or others, the plain fact remains that 100,000 acres was the figure aimed at, and 86,429 acres have come in, and notwithstanding Mr. Kirk's discourteous remark, there is no "juggling" with the above figures. The rest of Mr. Kirk's letter and figures we have nothing to do with, as the latter are evidently imported into his letter to obscure the one solid fact that 100,000 acres were required of which 86½% have subscribed: and we hope that notwithstanding the numerous cavilling criticisms that have appeared "the casual reader" (amongst whom we must number Mr. Kirk) will bear this one fact in mind and not allow himself to be diverted from the point at issue by carping criticism. Every scheme ever put up will find detractors, honest or otherwise. In every walk in life it is the same, and as we act, do or suffer, each and every one will find his meed. To compare great things with small, as Homer had his Zoilus, so an unknown Editor will have his Kirk. We like not that word "juggle." Ed.]

Fiji.

Importation of Trees, Plants, Fruit and Seeds.—The Board of Trade have received, through the Colonial Office, copy of the "Diseases of Plants Ordinance, 1913" (No. 6 of 1913), relating to the diseases of plants in the Colony.

The Ordinance, which repeals the Diseases of Plants Ordinances Nos. 7 of 1891 and 25 of 1911, empowers the Governor-in-Council to prohibit the importation of trees, plants, fruit or seeds, or portions thereof from any country, except by the consent and subject to the conditions that may be imposed by the Governor-in-Council.

Any person who shall introduce into the Colony any trees, plants, fruit or seed, or any portions thereof, in contravention of the above provisions shall be liable on conviction to a penalty not exceeding £100, or in default of payment to imprisonment for any term not exceeding six months.

Plants, &c. introduced in contravention of the prohibition may be seized and destroyed.

The Governor-in-Council may make such regulations as may be deemed necessary for carrying into effect the provisions of the Ordinance, which is to come into force on such date as the Governor may, by Proclamation, direct and appoint.—(*The Board of Trade Journal.*)

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 24.] JUNE 13, 1914. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Labour Barometer has risen to 88,574·41 acres this week. Two weeks only remain in which to force the mercury up to the required point: and we publish a letter from "The Pilgrim" which contains sound advice, and one who, as his letter tells us, has had a varied experience of the Labour Difficulties in Northern India, and how they have been practically settled under the auspices of the Indian Tea Association. Reasoning by analogy, and as an onlooker with an unprejudiced mind, he inculcates a lesson that should be taken to heart by every waverer.

We publish the Proceedings of the West Coast Planters' Association, and those of the South Mysore Planters' Association.

In this issue we conclude Mr. Aylmer Martin's articles on Motherhood and Infancy among Estate coolies which will be read with interest by all, and we have no doubt but that the seeds sown by him will fall on fertile ground, to the ultimate benefit of labour on the estates. It is a terrible statement that he makes that "about half of our coolie population die in the first year of their existence." Surely this is preventible and Mr. Martin points the way.

All Coffee planters will read with interest the history of their industry which we extract from *Simmon's Spice Mill.* We shall continue to publish the article, as it is interesting to know and learn of the rise and spread of one's own Industry.

We publish a letter from Mr. Barber which should surely lay the ghost of many still existing misapprehensions in the minds of those who still doubt the necessity, utility and scope of the proposed Labour Department.

Mr. Birnie contributes two letters in answer to Mr. Graham and Nemo.

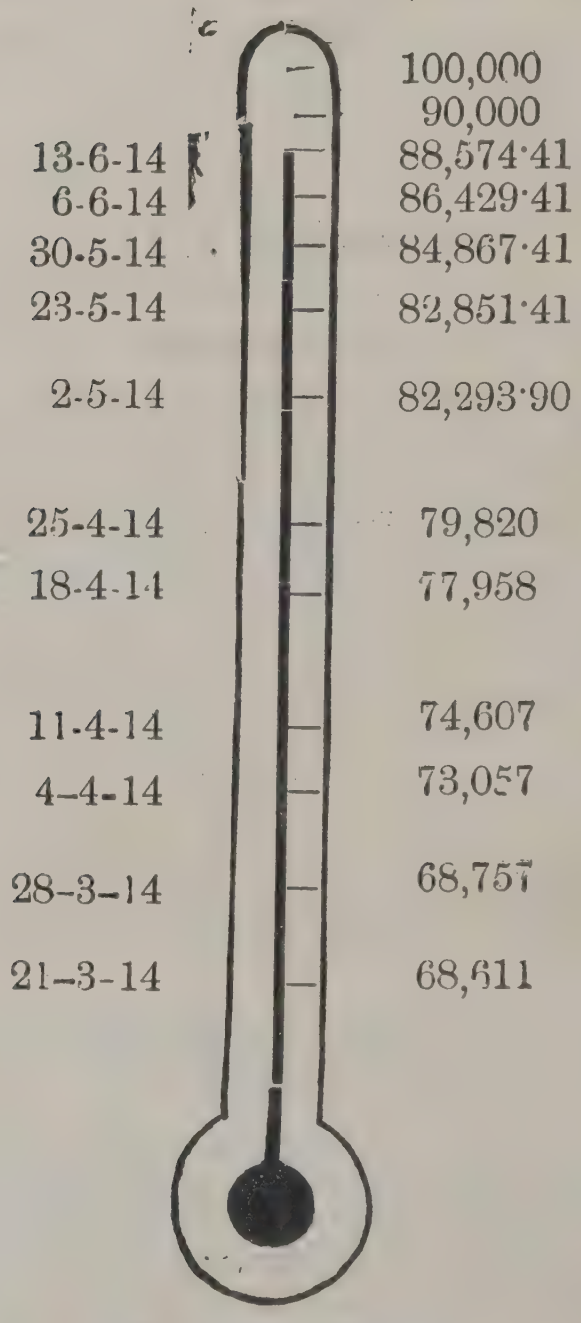
Mr. Aylmer Martin asks us to announce that his address until August 29th, will be Messrs. Thos. Cook & Son, Ludgate Circus, London, and that he hopes to arrive in Colombo on Sept. 26th.

For the information of those who intend to attend the Annual Meeting on July 6th, there will be a Gymkhana Race Meeting on the afternoon of the 4th Proximo.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

West Coast Planters' Association

Proceedings of a General Meeting held at Malabar Club, Calicut, on 5th June, 1914.

PRESENT.—Mooply Valley Rubber Co., per A. H. Mead (Chairman) and H. Walmesley, Kerala Rubber Co., per R. Lescher, Eddivanna R. and T. Co., per B. Malcolm, Malayalam R. and T. Co., per A. C. Morrell, Periya Rubber Co., per J. Martin, Pudukad Rubber Co., per T. D. Dixon, Wandur Estate, per R. Lescher, Pullangode, per H. Waddington (Honorary Secretary). *Visitors* ; Messrs. J. L. Henderson, K. S. West, W. O. Wright, R. Birnie, W. R. Wright, H. Browne, W. H. F. Lincoln, C. E. M. Browne, A. H. Sheldrick, and H. B. Winterbotham.

The Chairman, Mr. A. H. Mead, in a short speech opened the meeting.

PROCEEDINGS OF LAST MEETING were taken as read and confirmed.

HONORARY SECRETARY'S REPORT.—The Honorary Secretary made a short report and apology for the little business done since last meeting, and placed on the table a memorandum as to financial position of Association to date.

199. NEW MEMBERS.—The Wandur Estate has joined the Association. Mr. Mead gave notice that he wished his Superintendents, as per list handed the Honorary Secretary, to exercise the votes attached to the estates of which they have charge.—Recorded.

200. MEETING OF DELEGATES FROM TRAVANCORE, WEST COAST AND COCHIN ASSOCIATIONS.—Read letter from Central Travancore Planters' Association and proceedings of the Mundakayam Planters' Association. As the proposal seemed to chiefly concern Members residing in Travancore, the meeting considered it a matter to be dealt with by the North Travancore Branch of W. C. P. A. to whom they refer it.

201. SOUTH INDIAN RUBBER GROWERS' ASSOCIATION.—The Honorary Secretary reported nothing further had been heard on the matter and was requested to approach the various Associations interested in the matter.

202. U. P. A. S. I. CONFERENCE AT BANGALORE. ELECTION OF DELEGATES.—Proposed by Mr. A. C. Morrell and seconded by Mr. J. Martin "That Messrs. Mead and Waddington represent this Association at Bangalore next month."

An amendment proposed by Mr. Mead that Messrs. Morrell and Waddington be the Delegates was lost. Original proposition.—Carried.

203. LONDON SCHOOL OF TROPICAL MEDICINE.—Read correspondence *re* oversight by which amount voted for this was not sent. Honorary Secretary's letter was approved and delegates were instructed to take sense of U. P. A. Meeting as to whether the money should now be sent or matter be allowed to drop.

204. SCIENTIFIC OFFICER SCHEME.—Read circular from Nilgiri Planters' Association ; Honorary Secretary was asked to convey our thanks for same to Messrs. Barber and Nicolls. Resolved : "That this Association approves of the idea of Mr. Anstead and the Scientific Department being taken over by Government provided that Planters' interests are satisfactorily safeguarded."

205. LABOUR DEPARTMENT.—The Honorary Secretary reported that members of this Association representing 2,923·75 acres were supporting the scheme. Mr. Malcolm asked that the Edivanna Rubber and tea Co.'s 800 acres should be added to list.

Read correspondence as regards Preferential Treatment and probable policy of Department in regard to non-subscribers from Cochin Planters' Association, Secretary of U. P. A. and members of Executive Committee.

If subscribers are willing that the Department should be started the Delegates were instructed to record this Association's vote in favour of same.

Resolved that Delegates should discountenance any idea of penalising estates that may join later.

In view of this meeting the Control Committee as constituted is keeping a large area from supporting the scheme.

206. PRELIMINARY AGENDA U. P. A. CONFERENCE was read. Except to have L. School of T. Medicine included in accordance with minute 203, members had no additions to suggest.

A vote of thanks to the Honorary Secretary and members of Malabar Club for use of the room was carried.

With a vote of thanks to the chair the proceedings terminated.

(Signed) A. H. MEAD,
Chairman,
H. WADDINGTON.
Honorary Secretary.

Annual Meeting of the U. P. A. S. I. will open on the 6th July. The Secretary asks members to send interesting exhibits for the usual Exhibition not later than 1st of the month.

South Mysore Planters' Association.

Minutes of a Special General Meeting held at the Hanbalu T. B. 1st June, 1914.

PRESENT.—Messrs. J. G. H. Crawford (President), J. G. Hamilton, F. M. Hamilton, A. Hill, M, J, Woodbridge, G. N. Frattini, H. F. Anderson, L. Newcome, S. Sladden, C. K. Pittock, W. F. Scholfield, A. Thomson, E. W. Rutherford (Hon. Secretary).

The President Mr. J. G. H. Crawford speaking from the Chair opened the Meeting as follows:—

TO THE MEMBERS OF THE SOUTH MYSORE PLANTERS' ASSOCIATION.

Gentlemen,—In opening this Meeting I would like to place on record, and in doing so I am sure I am voicing the wishes not only of all here but every member of this Association; our great sorrow at the death of Mr. Graham Anderson and our sympathy with Mr. Robert Anderson and his family.

In Mr. Anderson this Association and the Planting Community have sustained an irreparable loss. he was one of the original founders and during a long and busy life invariably had its welfare at heart and never spared time and trouble for the furthering of its interests,, and that of the community at large. Personally I have lost an old and valued friend, one whose counsel and mature experience I greatly esteemed. I owe a debt of

gratitude to him for much disinterested advice, as a young man his companionship aided me in many ways and I can say that his example was always for good. This I think was felt and admitted on all sides. His self-sacrifice and aid to the famine stricken in the terrible years of 1877/8 and his kindness of heart generally are too well known to need any advocacy of mine, being merely instances of the great and sterling qualities of our old friend. He passed away in the midst of those he worked with and loved after a life of devotion to duty, his memory will always be revered and his character and example serve as a guide to all as to how an English gentleman in the truest sense of the word should live.

The Chairman then informed the Meeting of the death of the Honorable Mrs. Elliot wife of Mr. Robert Elliot one of our oldest planters. It was resolved that a letter of condolence should be sent to him on behalf of the Members of the South Mysore Planters' Association expressing regret at his loss.

The business of the day was then proceeded with.

It was settled that the 6th July would suit Members of this Association to attend the Annual Meeting of the U. P. A. S. I. and the President with Mr. C. Lake and and Mr. M. J. Woodbridge were appointed as Delegates to attend the Meeting.

INSTRUCTIONS TO DELEGATES TO U. P. A. S I.—The draft Agenda of U. P. A. S. I. was gone through and all subjects of interest to this Association were discussed, so as to enable the Delegates to get the opinions of the Members on the subjects to be brought up at the U. P. A. S. I. Meeting.

NOMINATION OF MEMBER FOR HASSAN DISTRICT BOARD.—Resolved that Mr. C. Lake's name be sent in for nomination to sit on the District Board, as representative of the S. M. P. A.

AMENDENT OF RULES ESPECIALLY REGARDING THE EXECUTIVE OF ASSOCIATION.—The subject having been discussed by all members present, it was proposed by Mr. C. K. Pittock, seconded by Mr. S. Sladden: "That Rule 3 be amended as follows: "That the word "Committee" be deleted and "Vice-President" inserted and Rule 4 be expunged and that in any case in the Rules where the word 'Committee' occurs the word 'Executive' be substituted,"—Carried.

Mr. M. J. Woobridge was unanimously elected Vice-President.

It was agreed that all other Rules should stand as at present.

SCIENTIFIC DEPARTMENT. COUNCIL OF THE MYSORE ASSOCIATIONS. —These subjects were discussed. Mr. J. G. Hamilton regretting that, as he was most probably leaving the District, he would be unable any longer to serve in Council, so placed his resignation before the Meeting. Mr. F. M. Hamilton was elected to represent the Association in his place.

CO-OPERATION IN THE PURCHASE OF MANURE.—The Sub-Committee read their progress report to the Meeting and a unanimous vote of thanks was passed to the Committee for the trouble they had taken.

CORRESPONDENCE.—Letter from the Central Travancore Association and Mr. K. Thamiah were read and the Honorary Secretary was instructed to reply to same.

After a vote of thanks to the Chair the Meeting terminated.

(Signed) E. W. RUTHERFORD.
Honorary Secretary.

MOTHERHOOD AND INFANCY AMONG ESTATE COOLIES.

By

Aylmer Martin.

III.

District Associations (or even groups of Estates), which recognise the necessity of a Medical Fund, might go further and procure the services of a qualified midwife. If the woman is of the right sort, and gains the confidence of the coolies, much good will certainly result. She should be encouraged to visit the lines on as many estates as may be conveniently done, and make enquiries on the subject of her work. Too much should not be expected of her; a good knowledge of all the women on a few estates is far better than a mere nodding acquaintance with those on a very large area. If she is popular on a few estates, her services will be requisitioned fast enough by those who have not even seen her. Promiscuous "advice," except on general principles, to pregnant women is not to be encouraged, as the midwife is only trained to attend at delivery, and a fortnight afterwards, and advising "officially," without being able to make a correct diagnosis of the numerous functional and organic diseases of pregnancy,—some of them quite obscure,—might be dangerous. That is the Doctor's work, and in dealing with such cases, a doctor might very well use the midwife as an interpreter, and to see his orders carried out. In other respects, also, she could be very useful apart from her professional duty; for instance by collecting information of pregnancy and reporting it to the proper quarter, preferably direct to the Manager of the Estate, who could tell the Doctor, if there is one whose services are at the disposal of that estate,—as there always should be. Women could be encouraged to notify voluntarily their condition early by promise of some "maternity benefit" when the child is born. This suggestion is not the result of my present comparative proximity to the land of Lloyd George. It was in my mind before I heard of the Robber of henroosts. Here again care is required, or the husband reaps the benefit instead of the mother and child, as is sometimes the case in the enlightened country to which I have just alluded; beer for the father instead of milk for the infant being the result of haphazard gifts given without sufficient care and discrimination being exercised.

On some estates in South India five rupees is paid to every woman whose child is born on the estate and is alive when the woman returns to her village, or when it is a stated number of months old.

An important point is to allow ample time, during working hours and in all weathers, for the mother to suckle her child. The proper food for a baby is its mother's milk. If there is any difficulty about this, owing to the mother's health, she might be helped out with a suitable meal of cooked food once a day at estate expense. I have a photograph on my 1914 advertisement showing a group of nursing mothers and weakly children who are being fed on an estate. The various brands of artificial foods for babies are well known and they are all the better digested if the mother can partially feed her child from her own breast.

I must add a word of warning against expecting any gratitude for all the trouble we may take, or the expense we may incur. We are doing all this for the benefit of our own community and not because it is humane or charitable,

We will suppose then that our coolies at last realise that we consider pregnancy an honourable state, the birth of live babies and their subsequent career of vital importance. Might we go a little further once in a way and let the estate adopt an "unwanted" baby or two? In 11 years I have only had two "Labour Department" babies. The parents of one died of cholera on their journey between the estate and their village. The child thrived for 4 years and was then claimed by the grandparents to whom I gave it up. The other was found in one of our cooly chuttrams, newly born but deserted. So many gangs of coolies had been passing through and so cleverly had the mother managed to keep her secret, that I was unable to fix the responsibility on anybody. My wife was with me on the spot at the time this domestice occurrence was reported, and luckily malted milk was available; but all our efforts and arrangements were in vain in this case, as the infant died in a few weeks, much to the disappointment of ourselves and others interested in watching the experiment. When such babies grow up they may go elsewhere, and our expenditure on them be a dead loss apparently, but not really, for who can tell how far the consequences of our action may have reached? Even if a few extra babies are brought forth alive, and have not fallen victims to tetanus or blood-poisoning at birth, and have survived to become themselves the fathers and mothers of a new generation of coolies, we shall have gained something. The general reputation of European employers will have benefited, and the point with which I started first will have been gained: we shall have removed from our coolies' minds the impression which now exists on the subject of births and infant mortality.

To go back to the subject of qualified midwives. The present supply is absurdly inadequate. Those trained at Government expense, or at the expense of Municipalities and Local Funds, are generally under an obligation to serve a term of years in return for the money spent, and, considering that the sum of Rs.250 is all that is required for their training, a hard bargain is generally driven with them. It would be difficult for other employers to get trained women, as no one wants to employ those who have already proved unsatisfactory in their former billets. Planting Districts are not popular with well educated women, and this is not to be wondered at under present conditions. To pick out a suitable candidate for training is far more difficult than to arrange for the training itself, or for subsequent employment. There are many chances against continuity of employment, which is very unfortunate; disagreements, discontent, and aspirations towards matrimony, for instance, have to be faced. The most practical way is to have one always in training for each billet in case of accidents. This would add to the expense of any Medical Fund, but the benefit to be derived is far beyond the expense to be borne. To establish this statement I need only mention that Dr. Langley Hunt, in his address to a District Planters' Association in Ceylon, when referring to this subject said:—"This had already been tried in some parts of the Island with marked success, and infantile mortality had been reduced from 50 per cent. to 7½ per cent. on Estates where the trouble and expense had been taken of employing a midwife.—(*Ceylon Times*, January 19th, 1914.)

Considering the number of those of us who make our living from the products cultivated by European planters, and the prosperity of the present times, I am sure many will come forward voluntarily with Rs.250 for the purpose of training a midwife for the benefit of coolies, or in the alternative for the benefit of the future labour supply of our estates, whichever point of view appeals to them most. In this paper I only try to advance the baser

motive. The sum mentioned can be afforded without driving a bargain and without attaching conditions which deter candidates from undergoing the necessary training.

The principal argument of the scorpion is at the end of its tail, and realising the penetrative effect of this method of procedure, I have reserved to the end of my paper a formidable tale with which to drive home my point.

About half of our cooly population die in the first year of their existence.

The number of lives lost to us during that one year is greater than in any subsequent twelve months of their life.

Many of the deaths are from causes easily prevented.

At the present moment I am not able to verify my references, but next week I hope to add an appendix which will enable everyone to judge for themselves whether it is possible to ignore the appalling mortality of infants any longer.

AYLMER MARTIN.

PLANT DISEASES.

From the time that the seed of a plant is placed in the soil its struggle for existence begins. Numerous hostile agencies are lurking around, always on the alert, ready to seize the first opportunity to fasten on to any part of the system of the plant that exhibits a weak spot. If the plant is delicate from hereditary causes or from want of proper nourishment or moisture, it will succumb unless helped to combat successfully its insidious foe. Some plants are more liable to attacks than others, and among those most subject may be classed the potato and the turnip.

The best preventive against disease is to see that good seed is put into the ground, and that the plants are supplied with a sufficiency of the different constituents of plant food.

One-sided manuring produces a decided tendency to disease.—*Mark Lane Express Agricultural Journal.*

KAINIT MAKES SLAG MORE SOLUBLE.

It has been observed that the application of mixtures of basic slag and kainit yield better results than the separate application of the two fertilisers, and with the object of investigating the reason a set of experiments was carried out on the Continent. From the results obtained it appears that the admixture of kainit with basic slag increases the soluble character of the latter by 6 to 10 per cent.

It was further proved that the activity of the phosphoric acid in bone meal is similarly increased by admixture of kainit with the meal.

There is no doubt, says the report, that the phosphoric acid of basic slag as well as of bone meal is rendered, by being mixed with kainit, more soluble, and therefore more easily assimilable by plants.

The unfavourable action of lime in the soil on the efficacy of bone meal, as stated by Professors Kellner and Bottcher, was also confirmed.—*Mark Lane Express Agricultural Journal.*

COFFEE.

The Commercial Aspect of Coffee.

The dawn of the history of commerce in coffee in England is, in fact, the history of the establishment of coffee houses in London, and the rise and development of these institutions provide such an interesting study as to demand more than a passing reference. As Isaac D'Israeli truly says: "The history of coffee houses, ere the invention of clubs, was that of the manners, the morals, and the politics of a people."

Coffee has been mentioned as early as 1621 by Bacon in his *Sylva Sylvarum* as the "drink that comforteth the brain and head and helpeth digestion." But this opinion was doubtless given on the strength of its reputation in the East, and there is no evidence that Bacon had either seen or tasted it. (*E. Hepple Hall*).

In Evelyn's Diary under the date May 10, 1637, there is the record: "There came in my time to the College (*i. e.* Balliol, Oxford) one Nathaniel Canopios out of Greece. He was the first I ever saw drink coffee."

Introduction of Coffee into England.

Not till 1650, however, is there any record of a coffee house in England, and then not in London but at Oxford, at the "Angel" in the Parish of St. Peter in the East, one was opened by Jacob, a Jew. It would appear to have prospered, for four years later one Cirques Jobson opened a house for the sale of coffee and chocolate between Edmund Hall and Queen College Corner.

It seems to have been expediency rather than design which led to the establishment of the first coffee house in London, when in 1652, or possibly a year or two later, Daniel Edwards, a merchant, allowed his Greek servant, Pasque Rossee, to open an establishment, in St. Michael's Alley, Cornhill, and the intention was to relieve his house of the constant stream of visitors and curious callers, all anxious to taste the new importation from Turkey. In like manner, centuries earlier, inns had been opened to relieve the landed proprietors of giving hospitality to travellers, and their retainers were installed as landlords under the protection of the patron's arms, and thus we get such signs as "Clinton Arms," "Somerset Arms," "Berkeley Arms," "Duke of York," and so on.

Rossee's first advertisement is still preserved in the British Museum. To see it awakens reflections on the mutability of the apparently permanent, and the occasional permanence of the actually fragile. The old coffee houses have long since been pulled down to make way for modern buildings, which again have had to yield to banks, palatial insurance buildings, and the like. But when they in their turn have possibly succumbed to the mammoth "skycraper," the handbill will still be in the British Museum. It is printed on a half sheet which formed the ordinary shop or handbill of that day and ran as follows:

"The virtue of the coffee drink first made and publiquely sold in England, by Pasque Rossee, made and sold in St. Michael's Alley, Cornhill, by Pasque Rossee at the sign of his own head."

Possibly because of his unfamiliarity with the language Pasque was joined in partnership by one Bowman, coachman to Daniel Edward's son-in-law, but apparently the partners soon fell out, and Bowman got leave to pitch a tent in St. Michael's churchyard, and there to sell his coffee in opposition to Pasque. Jonathan Payntes, who afterwards established a

famous coffee house known as "Jonathan's" (which was long the resort of the stock jobbers), learned his business at Pasque Rossee's, to whom he had been apprenticed. In 1657 a barber named James Farr opened a coffee room in the "Rainbow," in Fleet Street. Energetic and enterprising, he soon got so considerable a trade together as to provoke the opposition of his neighbours, the vintners and brewers, who viewed the rise and progress of coffee drinking much as the silversmiths of Ephesus had feared the introduction of Christianity by St. Paul. They moved all the penalties of the law against him, and charged with being "a nuisance and a prejudice to the neighbourhood."

Public opinion, however, welcomed the innovation, and the number of coffee houses greatly increased. The close of the Civil War and the advent of the piping times of peace had focussed society on London. Once again England was making herself heard in the councils of Europe as never before since the days of Elizabeth. Her navy was challenging the Dutch for supremacy, and her merchants were asserting themselves with confidence in society and in the affairs of State.

Popularity and Rapid Spread of the Early Coffee Houses.

The gregarious instincts of leisured men found opportunities of entertainment more cheaply and more wisely than had been furnished by taverns, and it soon become fashionable to frequent the coffee houses and partake of the newly imported Turkish beverage. The result was a marked increase in their numbers. From Bishopsgate to Charing Cross, and from Southwark to the Barbican, they sprang up as rapidly as the demand, but their greatest profusion was in the neighbourhood of the Royal Exchange.

Early in the history of coffee in England room should be found to chronicle the fact that a worthy, named Elford, won renown by inventing a white iron machine for roasting coffee, which was much used and was turned on a spit by a jack.

In 1660 coffee was first taxed in its liquid state, and it was ordered that for every gallon sold four pence tax should be paid by the makers, and that none should keep open a coffee house unless he had given surety for the payment of these dues and obtained Government license for the sum of 12 pence: and an infraction of these rules entailed a liability to a fine of £5 for every month during which the illegal sale was continued. At that time even the coffee used for domestic consumption was puchased from the coffee houses in liquid state.

The First Coffee Advertisement.

The first known advertisement of coffee in the press occurs in No. 1 of the *Publick Advertiser* for the week ending May 26, 1657, and is worthy of full quotation:

"In Bartholomew Lane, on the back side of the old Exchange, the drink called coffee, which is a very wholesome and physical drink, having many excellent vertues, closes the orifice of the stomach, fortifies the heat within, helpeth digestion, quickeneth the spirits, making the heart light-some, is good against eye-sores, coughs or colds, rhumes, consumption, head ache, dropsie, gout, scurvy, King's evil, and many others, is to be sold in the morning and at three of the clock in the afternoon."

As early as 1659 the coffee house in Palace Yard was the meeting place of James Harrington's club, the "Rota", a debating society for the discussion of political problems.

By 1662 the "Native Coffee House" near the stocks was the resort of doctors and scholars, and we learn from the amusing verses of "News from the Coffee House." In 1667, that in some places the conversation turned on city fashions and foibles, as well as on the affairs of State.

In that year Charles II, attended by the Duke of York and suite, was present at the acting of play called "Tarngo's Wiles, or The Coffee House," which Pepys briefly and unfavourably criticises as "The most ridiculous and insipid play I ever saw in my life." Pepys' diary, however, that mine of wealth to the sociological student of the period,—furnishes extremely little information about coffee houses or their frequenters, and there is abundant reason for believing that the author never transferred to coffee his affection for the more potent bowl.

To a worthy named Alexander Man, a Scotsman, who had followed General Monk to London and set up in the neighbourhood of Whitehall, the King had given the first Royal warrant for coffee, and he proudly declared himself "Coffee Man to Charles II."

In 1672 the King, having been informed of the "inconveniences arising from the great number of persons that resort to Coffee houses, desired the Lord Keepers and the Judges to give their opinion in writing how far he may lawfully proceed against them." After much argument by lords, the Keepers and Judges record in cautious and ambiguous language that: "Retailing coffee *might* be an innocent trade as it *might* be excised. but as it is used at present, in the nature of a common assembly, to discourse of matters of State, news and great persons, as they are nurseries of idleness and pragmaticalness, and hinder the expense of our native provisions, they *might* be thought common nuisances."

Sir William Coventry spoke earnestly in their favour. "The Government," said he, "obtained from coffee a considerable revenue, and the King himself owed to these seemingly obnoxious places no small debt of gratitude in the matter of his own restoration, for they had been permitted, in Cromwell's time, and then the King's friends had used more liberty of speech than they durst do in any other. Moreover, it would be rash to issue a command so likely to be disobeyed notwithstanding his command to the contrary."

In 1675 the author of "The Coffee Houses Vindicated" asks: "Now, whither shall a person wearied with hard study, or the turmoils of a tedious day, repair to refresh himself? or where can young gentlemen, or shopkeepers, more innocently and advantageously spend an hour or two in the evening, than at a coffee-house? To read *men* is acknowledged more useful than books, but where is there a better library for that study generally than here among such a variety of humors, all expressing themselves on divers subjects, according to their respective abilities."

However, neither the hesitation of the judges, Coventry's wisdom, nor the vindication just quoted, could save Charles from himself, and in December, 1675, was issued:

Charles II's Proclamation and Its Revocation.

BY THE KING, A PROCLAMATION FOR THE SUPPRESSION OF COFFEE HOUSES.

Charles R.

Whereas it is most apparent that the multitude of coffee houses of late years set up and kept within this kingdom, the Dominion of Wales, and the town of Berwick-upon-Tweed, and the great resort of idle and disaffected persons to them have produced very evil and dangerous effects,

as well for that many tradesman and others do herein mis-spend much of their time which might and probably would be employed in and about their lawful calling and affairs, but also for that in such houses divers false, malitious and scandalous reports are devised and spread abroad to the defamation of His Majesty's Government, and to the disturbance of the peace and quiet of this realm, His Majesty hath thought fit and necessary that the said coffee houses be (for the future) put down and suppressed and doth strictly charge and command all manner of persons, that they or any of them do not presume from and after the tenth day of January next ensuing, to keep any pubiic coffee house, or to utter or sell by retail, in his, or her or their house or houses (to be spent or consumed within the same), any coffee, chocolate, sherbett or tea as they will answer the contrary at their utmost peril.

Given under our court at Whitehall this third and twentieth day of December, 1675, in the seven and twentieth year of our reign.

"God save the King."

But this very definite and forcibly worded edict was provocative of so much ill feeling and discontent that men of all parties cried aloud for its revocation, and before the tenth of January, on which it was to become operative, His Gracious Majesty caused the proclamation to be withdrawn and out of his "princely consideration and royal compassion all and every of his retailers of the liquor aforesaid shall be allowed to keep open till the four and twentieth day of June next," and even this latter date appears only to have been mentioned to save the face of the King's most excellent Majesty. Thus, at a time when parliaments were not to be relied on, and the liberty of the Press did not exist, the coffee house keepers, and those who frequented and supported their establishments, won a bloodless but most effective battle for freedom of speech and placed posterity under a debt of gratitude of which it is too little conscious.

The royal declaration and its revocation had the notable effect of raising the proprietors of the coffee houses unto quite important personages. Having been to some extent made responsible for the opinions as well as the conduct of their guests, the masters of these establishments acquired a dignity they had never previously aspired to, and quite a degree of fame attended the names of the owners of the most frequented houses.

Both in Lombard St. and Abchurch Lane were a number of these establishments, and no fewer than four of the principal ones stood in Exchange Alley, facing the corner of Lombard St. and Abchurch Lane. Here Strype tells us in his *Survey of London* (*1720*) were "divers eminent coffee houses, Garaway's, Jonathan's, Baker's, Elmer's, chiefly frequented by brokers, stock-jobbers, Frenchmen, Jews, as well as other merchants and gentlemen.' It was the general rule that anyone who chose might enter, and on payment of a penny become free of the house. Whether he ordered refreshment or not he was provided with a chair and shelter and such newspapers as could then be obtained, but best of all, he could hear all the gosssp going on:

"So great an university
I think their ne'er was any
In which you may a scholar be
For spending of a penney."

Bridge's coffee house and warehouse stood in the neighbouring Pope's Head Alley and was much patronized by ship brokers, captains and merchants.—*Simmon's Spice Mill.*

(*To be continued*).

CORRESPONDENCE.

Woodlands, Kullakamby P. O.,
2nd June, 1914.

Labour Department.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—From the note in your issue of 30th ultimo I see that you expect me to reply to Mr. Lund's letter which you print in the same issue.

I will start by expressing regret that Mr. Lund has refrained from criticism which, as he thinks, would have been highly beneficial.

Mr. Lund sees the scheme as purely a business proposition. What is he going to get out of it? Nothing! So he does not join and quite right too. But he seems to express annoyance that those who do join should expect to get something out of it. If they do benefit by the scheme, at whose expense will they benefit? Certainly not at the expense of their fellow-subscribers. How the advantage will be obtained is fully explained in Mr. Richardson's letter of 13th May.

As a matter of fact I believe the mere fact that if a labour organization exists it will benefit the community at large. If it proves a success it will be there, ready for the non-subscribers to join, but surely it would be too unbusinesslike, if non-subscribers reaped equal benefits with subscribers.

I am not wrong when I say "those that are not for us are against us." Every acre withheld will be a weakness to the department. If a large acreage holds out it may or may not wreck the scheme, but it will certainly tend to delay its full development and consequently diminish its power for good at first.

I thoroughly sympathise with Mr. Lund's three friends who have joined under compulsion. There's my case exactly, I have agreed to join because I feel I should be a fool not to join, and because I believe I shall reap some benefit from joining sooner or later. I have not agreed to join for the sheer pleasure of paying out Rs.2 per acre.

I disclaim any intention of threat, for one thing I am not more in a position to threaten than is any one else, and for another to threaten without the power of enforcing the threat is foolish.

Mr. Lund's suggestion as to how non-subscribers might use their 2 per acre as a set off against the advantages gained by those using the department is, of course, quite practical, but 2 to 4 annas a month is not a large rise of pay nor one which, I venture to think, is likely to deflect the flow of labour to his estate. It tends to point out, however, how very much less is the subscription to the proposed department, than any rise of pay that is likely to compete with the rates of pay paid to emigrate and others who move about the country in order to better themselves.

Yours faithfully,

E. F. BARBER.

How it Strikes a Stranger.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Sir,—Will you kindly permit a "Stranger and a Pilgrim" to take up some of your space with his views on the "Pros. and Cons. of the Labour Commission" based on an interested perusal of the correspondence which has appeared in your columns during the past month, commencing with Mr. Mead's letter of the 26th April.

As a new arrival in Southern India, I must plead guilty to a dense ignorance of all local labour conditions and questions. My interest in the matter arises from a long and intimate acquaintance with planters and their estates in Upper India; and some knowledge of labour questions and difficulties in Assam, under various "Acts"; in Cachar and Sylhet, which were the first to be emancipated from "Act" labour; and in Darjeeling and the Duars, which have always been "free labour" districts, without the aids—and hindrances—of an "Emigration Act." I have also a fair acquaintance with coolies of sorts, from the fine "jungly"—Sonthol, Kol, Uraon, Mundah, &c.,—from Chota Nagpur and the Santhal Pargannas; to the "Madrassi." We are not particular in Assam to distinguish whether he is Tamil, Telugu or Canarese, but are quite content to get as many of them as we can crib from you; though I think we generally get our lot from well up the East Coast, Ganjam way and thereabouts. But Northern Indian Tea Estates are immense and are growing, and they want lots of labour. Even the "Nor-wester"—the once despised "yellow-belly" from Upper Bengal and the Lower South West—is welcome. And that the "North" want as much out of the "South" as they can get has been evinced by recent correspondence in the daily papers, and growls at closing—or trying to close—Madras recruiting grounds to Assam and Cachar.

So it is evident that Madras, besides its own large and rapidly growing demand for labour, is surrounded by a hungry crowd who want all the coolies they can get; Ceylon, the Malay States and Upper India. And, in the absolute *necessity* for getting labour to keep our estates going and to carry out orders from home for new extensions, some of us cannot afford to be too particular as to the means by which we procure it. The old Scotchman's advice to his son: "Mak' siller, Donald; *honest*, if ye can; but,—mak' it," must be borne in mind.

Ignorant, as I admit I am, of all that the correspondents who are assailing the proposed Labour Commission must know in the way of coolies in Southern India generally, and local wants and requirements—still—a looker on sometimes sees a good deal of the game. And speaking generally, with keen "foreign" competition to be met and fraudulent maistries (who represent our Northern Indian *arkattis* I presume) to be suppressed, this does not seem to be a time to consider individual interests, or to start District Commissions which would inevitably work in opposition and against each other sooner or later, however good the intentions of the originators and promoters thereof may have been. It is now ancient history—the way the District Associations in Assam practically cut each others throats. How Darrang resented its "time expired" coolies being enticed away by Naugong; how Lakhimpur fought the same battle with Sibsager; and how they all by their opposition raised the cost of importing the bonuses given for renewals of agreement, and lessened the *nirik* (the "task") for which a *hazri*—which is here I believe known as a "full name"—is given) or raised the rates for *tilka* (contract) work. How, in short, each

district tried to "do" the next one, and in many cases individual neighbouring estates fought on the principle of "every man for himself—an' the divvle take the hindmost,"—till they were all gathered under the wing of the Indian Tea Association and accepted a general *modus vivendi*. Anyone who had knowledge of these doings must be convinced of the futility of Mr. Mead's "old heresy" to which he has "come back," in his letter of 26th April. His concluding paragraph asks: "What is the object of Mysore, Coorg and the West Coast paying for others troubles when they can attend to their own at least equally efficiently and at a quarter of the cost." In another place he says: "Let the Travancore Districts continue if they want to and work the Tinnevelly labour, which hardly interests another district, and let us who use West Coast labour combine to regulate it and protect it from foreign competition." Here we are again. As Paddy says:—"Ivery wan for himself, an' the divvle take the hindmost."

In these modern strenuous days we have not much use for old adages. Nevertheless the lesson of the bundle of sticks is carried out, practically, more and more, in these times of "Trades Unions" of all sorts. And the venerable old saw that "Union is strength" is so well recognised that we have it enshrined in various languages. *L'union fait la force*, the French say: the Germans are keen on *Einigkeit macht stark*. The Yankees are responsible for a line upholding union in a poem by General G. P. Morris, "The flag of our Union."—

"A song for our banner? The watchword recall

"Which gave our Republic her station:

"'United we stand; divided we fall!'

"It made—and preserves us—a nation."

The report on the Delegates from the Nilgiri Planters' Association to the Extraordinary General Meeting of the U. P. A. S. I. held at Bangalore on 11th March, which was read at the meeting of the N. P. A. on 2nd May, contains matter well worth mature consideration. Nothwithstanding Mr. Mead's tender solicitude for the pockets of the planters in Mysore and Coorg "paying for others troubles," it appears that the District Associations of Mysore and Coorg were convinced that if a reduced rate of subscription for Coffee were pressed, the whole scheme for the Labour Commission would be wrecked, and they unanimously agreed to the Rs. 2 per acre all round. They recognised that "Union is strength." The general remarks of Messrs. L. L. Porter and C. H. Brock are worth quoting—just to remind the waverers that they ought to hurry up, or they will "get left." Noting that the starting of the Labour Commission must necessarily be an expensive business, they go on:—"If any man thinks that the Labour Department is a move in the right direction, and does not support it from the start, so as to ensure its success, and so ensure its becoming cheaper and less of a drain on his pocket in future years, that man is stultifying his own opinion. The men who most pride themselves on being most successful with labour, and who assure you that they can get all the labour they want, even they admit that they have a great deal more difficulty in maintaining their staff of coolies than they used to have a few years back, and that the difficulty yearly gets worse. Your having all the coolies that you require now is but a poor excuse for not supporting the Labour Department. Is not insuring your personal self against this yearly increasing worry and trouble in getting and keeping your labour worth Rs. 2 per acre?"

Again we arrive at it: "Union is strength."

There are several paras. in Mr. Mead's letter I should like to go into. He "agrees with Mr. Barber that labour is generally more out of hand than it used to be, and that foreign competition will annually tend to become keener." But he goes back to his "heresy" (happily named); he wants each little stick to offer its individual puny resistance, ignoring the combined strength of the bundle. He admits that the Commission would certainly do good; but he will not help it by joining. There is another old saying based, I think, on Holy Writ this time; "He that is not for us is against us." Further, Mr Mead seems to have a way of setting up "Bogies" to frighten the unwary, who may not notice how unsubstantial they are, and how he himelf "lays" them; witness his para. about reservation of recruiting areas for certain districts. However, I am afraid I am trenching on your good nature, and your space, most unduly. Also I feel that the replies by Mr. Barber, Mr. Richardson and Mr. Danvers, in your issue of the 16th May, are far more effective than anything that I in my ignorance of local conditions—could say. I merely wish to set forth how the matter strikes a stranger, who has seen a good deal of labour difficulties in Northern India; and how convincing such experience is of the great truth of the old saw: "Union is strength." But that the advice of an outsider is worthless, I would say to all those who are helping to keep that barometer reading down to 84,867—when it ought to be up to 100,000:—Sink the personal equation; don't calculate what you, individually, or your little 'parish pump' will score by standing out—because it inevitably will *not* score, in the end: think "imperially" and not "parochially"—*i.e*, for the *general* welfare (in which you will surely partake) and not for that of the parish only; and contemplate seriously from every point of view—as the pious Yogi meditates on the Infinite—the inestimable truths contained in those three words, UNION IS STRENGTH. And let me recommend to your further consideration one more old adage—a classical one this time, going back as far as Euripides: "The gods hate those who hesitate." The ancient Greeks were a smart lot.

THE PILGRIM.

Coonoor, June 7th, 1914.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—I was told I could get in Geneva all the figures I wanted about infant mortality not only of Switzerland but of the whole world. I applied to the "Bureau des Statistiques" and also to the "Bureau d'Hygiene" however, without success; they apparently do not discriminate between infants under 12 months old and others.

Consequently I cannot fulfil my promise just now to supply figures as an appendix to the paper I sent you for publication. I have referred to some Medical books also, but although I find plenty of other information, the figures I want are not given. The people who seem to be most interested in the statistical side of the question are those who run Insurance Companies and Benefit Societies, and I know where to get the figures in London, but not here. I therefore crave your indulgence for another month or so.

Yours faithfully,

AYLMER MARTIN.

Geneva, 25—5—14.

4 F, South Parade,
Bangalore, 11th June, 1914.

Purchasing Potash Manures in England.

THE EDITOR,
Planters' Chronicle.

Dear Sir,— May I refer to Mr. Graham's letter in your paper of June 6th, and assure him that the letter upon which he comments was written simply to place the facts contained therein before the Planting Community and without bearing reference to any particular individual?

Regarding the purchase of Potash in London, I have been given to understand that enquiries have already been directed to some London Agents on the possibility of supplying these manures more cheaply from London and that these Agents held out no hopes of this being possible—the reason being as stated in my letter of the 20th ulto.

With regard to Mr. Graham's query, I may say that the Syndicate are naturally not unaware of the prices at which their produce is being sold in India or elsewhere, while I feel sure both of the Sales Agents in India would, on request, be pleased to submit their latest price list to him and quote comparison of their prices with those of manures landed from London.

Yours faithfully,
R. BIRNIE.

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4 F, South Parade,
Bangalore, 8th June, 1914.

Coffee Manuring Experiments.

THE EDITOR,
The Planters' Chronicle.

Dear Sir,—I have just returned from tour, and observe Nemo's letter in the *Planters' Chronicle* of the 9th ultimo.

It would seem that Nemo has perused the Scheme somewhat cursorily and so failed to note that it is purposely simple in outline and not intended to be all-comprehensive. Only a selection of the various fertilisers upon the market has been incorporated into the scheme—other sources of Nitrogen, Phosphoric acid and Potash being omitted.

He also appears to attach importance to the source of manures—else why should he lay stress on the " only nitrate *indigenous to India.*" It is, however, not the *source*, but the *final cost* and *ultimate efficiency*, of manures which are of importance.

When he further says that "" Nitrate of Potash" is cheaper than any imported Nitrate, his comparison is restricted to Nitrates, thereby excluding all other sources of Nitrogen. In this sense, this statement is somewhat misleading to the casual reader, for, though all Nitrates referred to are quickly available, nitrogenous manures, are not necessarily Nitrates. It is, of course, the *Nitrogen* contained that should be considered.

Though the above-mentioned fertiliser may be cheaper than any " imported nitrate " it is not, by any means, the cheapest form of quickly available nitrogen obtainable in India.

Nemo, however, may be interested to know that Saltpetre is included in the first published scheme of manures, and experiments with it were laid out during the past and present years, while, as noted in the last para. in the second scheme, " suggestions from intending experimenters will be welcomed and considered."

Yours faithfully,
R. BIRNIE.

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether and is on a level or slope near a river, &c, and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part in 20 of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzene. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent, if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,
The United Planters' Association of Southern India,
BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 25.] JUNE 20, 1914. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Barometer has risen to 89,619·41 acres. We publish two telegrams and a letter from the Executive Committee stating that they recommend the starting of the Department on the acreage secured. This decision, we trust will bring in those who still hesitate to support the scheme, and there only remain ten days before the Barometer is taken down. We only hope that the cause will be that the bulb has burst through over-pressure of those who rush in not to be the last.

We publish an article on the Saltpetre Industry taken from the *Times Supplement*.

The article on the Commercial Aspect of Coffee is continued and makes interesting reading.

A short article on Rubber is published.

Our correspondence columns are occupied by Mr. Kirk, "Deeds not Words," "Knowledge is power" and the Executive Committee's important letter to the Chairman and Councillors, U. P. A. S. I.

With regard to Mr. Kirk's letter, we have much pleasure in accepting his apology for the use of an unnecessary word, in the same spirit in which it was offered. Want of space prevents us answering his three questions in an Editorial footnote, so we do so here

(1) This can only be answered by the Executive Committee of the Labour Department.

(2) We are unable to answer this as we cannot enter into the minds of the Travancore Planters.

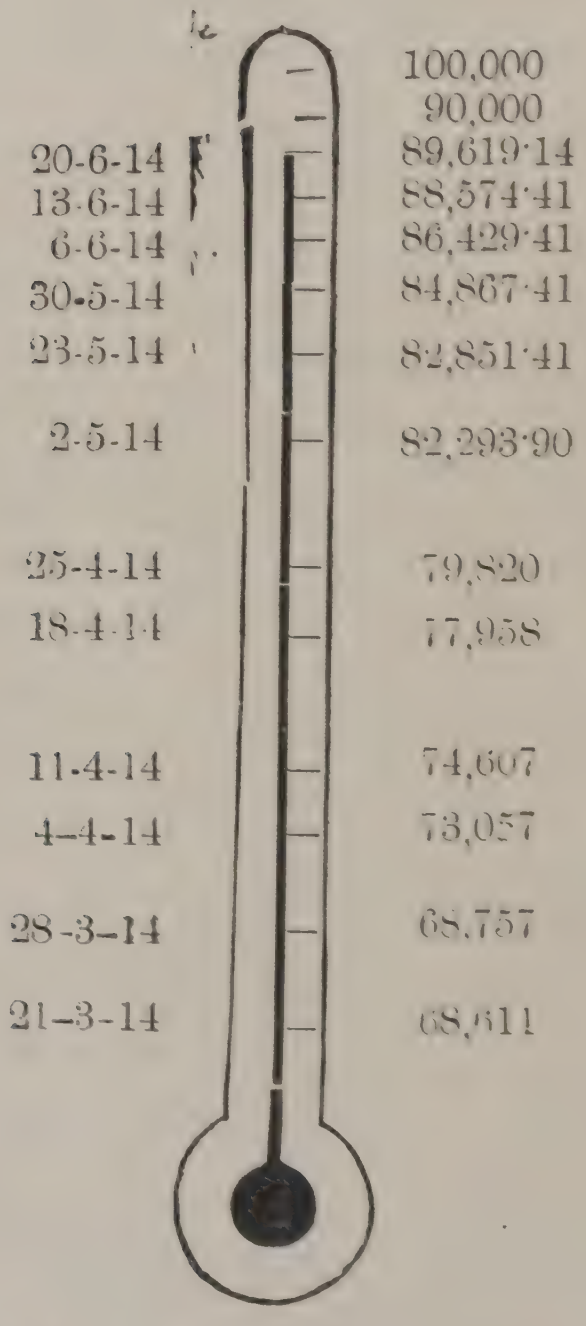
(3) The *Planters' Chronicle* is the official organ of the U, P. A. S. I. and not of the Labour Commission, though throughout it has been a strong supporter of the establishment of a Labour Department.

Mr. R. Birnie wishes the following correction to be made in the fourth para. of his letter of the 8th instant "In this sense, this statement is somewhat misleading to the casual reader, for, though all Nitrates referred to are quickly available nitrogenous manures, all quickly available nitrogenous manures, are not necessarily Nitrates. It is, of course, the *Nitrogen* contained that should be considered."

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

THE SALTPETRE INDUSTRY.

(NITRATE OF LIME)

Over 100 years ago Priestly and Cavendish discovered that atmospheric nitrogen could be oxidixed—that is to say, that it combined with oxygen under the influence of an electric discharge—and subsequently men like Sir William Crookes aed Rayleigh, Sir William Ramsay and others, have made valuable contributions towards the solution of the problem.

Th s, however, must all be considered as purely experimental, and it was not until 1902 that Messrs. Bradley and Lovejoy in America commenced to develop experimental into industrial working, by establishing a factory at Niagara, called the Atmospheric Product Co., with a share capital of one million dollars, for the purposing of producing nitrogenous products from the atmosphere. But as early as the summer of 1904 the enterprise had to be abandoned, as the method did not prove remunerative.

It was therefore left to two Norwegians, *viz.*, Professor Birkeland, of the University of Christiania, and Dr. S. Eyde, to be the first to manufacture nitrogen from the atmosphere with economically successful results.

The most essential cause of the success of their enterprise was that they worked with far higher amounts of electric energy than had been the case before, the characteristic feature of their invention being that they succeeded in producing an electric flame which could burn steadily, and with a considerable volume, even with very high amounts of energy up to several thousand kilowatts.

The Birkeland-Eyde furnances consist of quite a small circular flame chamber, in which the electric flame, playing between two water-cooled copper electrodes, is expanded with the aid of two very powerful magnets projecting into the furnace-house perpendicularly to the electrodes. This gives a very large contact surface between the flame and the air injected into the furnance, and in the elevated temperature generated—about 3,000 deg. (C)—the Atmospheric Nitrogen and Oxygen combine to form a gas,—oxide of nitrogen,—which is exhausted from the furnace and thereupon quickly cooled. This cooling is effected so that, among other things, the heat of the gases is utilized for heating boilers to generate the steam required for driving compressors, fans, &c. Thereupon the gases are passed through large oxidation vessels, in which process further oxygen is absorbed from the air, so that the gas is converted from nitrogen monoxide into nitrogen dioxide. This gas thereupon passes through large granite towers, filled with quartz, against a countercurrent of water, and forms nitric acid, which serves as a basis for the manufacture of a series of various nitrogenous products.

In 1815 a Company was formed, called "Norsk Hydro-Elektrisk Kvaelstof—Aktieselkab," with Mr. Eyde as General Manager. The capital was principally French and to a lesser part Swedish and Norwegian. Since its formation this company has developed into a very large concern, large even according to foreign ideas, having invested over £2,500,000 in water power and factory installations in Norway.

After some experimental trials in 1903 and 1904 on a very limited scale the first factory was erected at Notodden, in Telemark. This factory started work at the end of 1905 with a power of about 2,500 kilowatts. Meanwhile the company had also commenced the construction of works for the utilisation of the water power of Svaelgfos, about three miles from Notodden and the extension of the Notodden Works thus took place *pari passu* with the construction of power installations on this waterfall. Hence, as early as

1907, the factory at Notodden could receive about 30,000 h. p. from the Svaelgfos.

The manufacture first taken up at Notodden was the production of calcium-nitrate, long ago known throughout the world as "Norwegian saltpetre," a manure which is equal in value to Chili saltpetre. Subsequently the manufacture of sodium nitrate was taken up—a substance much used in the colour industry in aniline factories. A further product is ammonium nitrate, used in the manufacture of explosives, and lastly they have quite recently commenced to manufacture concentrated nitrate acid, of a strength of some 90 per cent., in which strength this acid can be exported.

In proof of the efficacy of Norwegian saltpetre as a manure we may mention that Professor and Privy Councillor Wagner, Ph. D., of Darmstadt, has found by exhaustive tests that for every 100 kilos of Norwegian saltpetre with which the soil is manured an increase of 250 kilos in the crop of wheat is obtained. Thus, for instance, 70,000 tons of Norwegian saltpetre, having a value of over £700,000, will increase the wheat crop by nearly £4,000,000. If this quantity of grain is computed at its food value, it will suffice to feed half a million persons on bread and to satisfy the normal bread requirements of one million persons.

The most important of the company's establishments now at work are the following:—

1. Notodden Saltpetre Works, which have been enlarged so as to take up about 65,000 h. p.; about 700 workmen are employed there at present.

2. Lienfos Power Station, situate at a distance of about three kilometres from Notodden, and supplying the whole of its power output to the Notodden Saltpetre Works. The Water power has a head of about 60ft. and the volume of water carried is about 2,650 cubic feet per second: there are fitted up four turbines of about 5,500 h. p. each, with alternating-current dynamos.

3. Svaelgfos Power Station, with a water power having a head of about 160ft. and a volume of water of 2,650 cubic feet per second. There are fitted up four-turbine sets, with alternating-current dynamo, of 10,000 h. p. each. Furthermore, a reserve power station has been erected in the same place, where two additional power sets of 10,000 h. p. each will shortly be installed. All the power generated in this station also is supplied to Notodden.

4. Rjukan Saltpetre Works, situated higher up in Telemark, about 43 miles from Notodden. A connexion between these two factories has been established by a broad guage railway line constructed by the Company. At a point between the two factories the railway connexion is broken by the large Tinnsjoen Lake, 15½ miles long. It serves as a regulating basin, with an effective storage capacity of about 7,000,000,000 cubic feet for Svaelgfos and Lienfos. Traffic across it is maintained by large ferry boats on to which railway trucks can be run for transport.

The Rjukan Salpetre Works obtain their power from the Rjukanfos Waterfall, well-known to tourists, on the Maaneelven (River) in Upper Telemark. It has considerably greater height of fall or head than the waterfalls lower down at Notodden previously referred to, and it has therefore been found practicable to utilize this head of water in two sections. One half, with a head of about 940 feet, has already been equipped with installations for utilizing the power, and has been working for about two years. The

aggregate amount of power developed by this power plant, about 125,000 h. p., is transmitted to the Rjukan Saltpetre Works, situated three miles lower down, where Norwegian Saltpetre, Sodium Nitrite and concentrated nitric acid are produced. The factory employs at present about nine-hundred hands. The locality where the factory is now situated—the so-called Vestfjorddal—was formerly almost uninhabited and only known to tourists. Now a handsome town has sprung up there with pretty well-planned streets and villas of stylish architecture for workmen and officials. About five million kroner has been invested altogether in buildings, whereof about 3,500,000 Kroner in workmen's houses alone.

5. RJUKAN POWER STATION, which has been briefly alluded to before, receives its water from the Mosvand lake, situated at an altitude of about 2,590 feet above sea level. Here the water is penned up by a dam about 52 feet high to form a regulating basin of about 28,000 million cubic feet storage capacity; no doubt the largest in the world next to the Assonan dam. A uniform volume of water of about 1,700 cubic feet per second is thus obtained, and it is supplied to the power station below,. A little beyond this lake, the river is conducted into a tunnel of about 1,000 cubic feet cross-section, and further, over a distance of about 2½ miles onward, to a distributing basin situated upon the slope. From there ten tubes of about 5 feet diameter lead down to the power station situated 935 feet lower than the distributing basin, and the water is delivered in the station, from each of the penstocks, into a turbine and dynamo set of about 14,500 h. p. There are therefore ten such sets collected in one building, and we have the imposing sight of 130,000 electric h. p. being quietly and regularly harnessed in the service of industry. By a power line 3½ miles in length the electric energy is transmitted at a pressure of 10,000 volts. down to the Rajukan Saltpetre Works.—*The Times Norwegian Supplement.*

LABOUR ON ESTATES IN THE EAST.

Judging from Eastern correspondence, one can only conclude that labour conditions throughout the rubber districts are far from satisfactory. In many areas it seems impossible to lower wages or reduce advances. Competition is getting keener every week, and the labour problem is undoubtedly causing much anxiety among managers. We know that the view held by some London directors is that, if a manager cannot get and keep labour, he should be removed. This is truly a short cut towards solution. But we doubt whether it is fair or even wise to adopt such a course on the majority of estates. Obviously where labour troubles are so widespread it is futile even to make the suggestion. We are hopeful that the stopping of extensions, the decrease in number of tapping cuts per tree, and the adoption of alternate day, instead of daily, tapping—all agriculturally sound—will help to relieve the situation. Meanwhile the subject cannot be lost sight of. The margin between present and possible wages on Eastern plantations is small; a reduction below 30—35 c. per day seems quite impossible. But this is by no means the case in parts of Africa and Brazil. We are aware of some conspicuous reductions already made in Africa; here the process is simple, as it resolves itself largely into one offering a lower price for the rubber brought in by the natives. Similarly, in Brazil, rubber is not generally collected by workmen on regular daily pay. Recently the Collector in Brazil could make sufficient in some seasons to keep him twelve months, because he received a percentage of the market price ruling for rubber.—*India Rubber Journal.—The Agricultural News.*

COFFEE.

The Commercial Aspect of Coffee.

(*Continued*)

Coffee Houses and the Poets.

Of the literary and political coffee houses perhaps the most famous was Wills', which stood at the south end of Bow St., Covent Garden. It was opened by William Unwin in 1660 and was made glorious by reason of the Poet Dryden making it his constant resort. The privilege of even entering that room during his occupancy of it was eagerly coveted by the literary aspirants of his day. There it was that Pepys saw him seated in the midst of an admiring throng on the 3rd of February, 1663. The room in which the company was assembled and had "very witty and pleasant discourse" was situated upstairs on the first floor, and there Dryden had his chair placed for him by the fireside in the Winter and on the balcony in the Summer.

Man's, near Charing Cross was the favorite haunt of the young cavaliers and fashionable beaux of the Restoration Age. Child's was in St. Paul's Churchyard and was much resorted to by the clergy and their friends. The St. James stood at the end of Pall Mall, near to what is now 87, St. James Street. It was an exclusively Whig house. The Grecian was in Devereux Court, Strand, and was still in existence as a tavern till 1842.

Advent of Modern Journalism in the Coffee Houses.

The advent of modern journalism may be said to have taken place when in 1709, Richard Steele brought out the *Tatler*. From the coffee houses he declares he will get his material, and to their clientele he as a frequenter of coffee houses addressed himself, and in the first issue dated April 12, it is stated: "All accounts of gallantry, pleasure and entertainment shall be under the article of White's coffee house; poetry under that of Will's coffee house; learning under the title of Grecian; foreign and dometic news you will have from St. James' coffee house, and what else I shall on any other subject offer shall be dated from my own apartment."

All this was under the *nom de plume* of Isaac Bickerstaff. The *Tatler* appeared three times a week till January 2, 1711, when it ceased abruptly, but out of its associations grew its renowned successor, the *Spectator*, and Richard Steele gave place to his greater friend and school fellow, Joseph Addison. In the first number he tells us: "There is no place of general resort wherein I do not often make my appearance. Sometimes, I am seen thrusting my head into a round of politicians at Will's, and listening with great attention to the narratives that are made in those little circular audiences. Sometimes, I smoke a pipe at Child's and while I seem attentive to nothing but the *Postman*, overhear the conversation of every table in the room. I appear on Sunday nights at St. James' coffee house, and *sometimes* join the little committee of politics in the inner room as one who comes there to hear and improve. My face is likewise very well known at the Grecian, the Cocoa Tree, and in the theatres both of Drury Lane and the Hay Market. I have been taken for a merchant upon the Exchange for above these 10 years, and sometimes pass for a Jew in the assembly of stock jobbers at Jonathan's, in short, wherever I see a cluster of people I always mix with them, though I never open my lips, but in my own club."

It is interesting to notice in No. 2 the same taciturnity, but still more that his allegiance to coffee was not confined to the coffee house, for he says: "I am now settled with a widow woman, who has a great many children and complies with my humour in everthing. I do not remember that we have exchanged a word together for these five years: my coffee comes

into my chamber every morning without asking for it, if I want fire I point to my chimney, if water, to my basin; upon which my landlady nods as much as to say she takes my meaning, and immediately obeys my signals."

Of both the *Tatler* and the *Spectator* Johnson wrote in his "Life of Addison", that they were "published at a time when two parties, loud, restless and violent, each with plausible declarations, and both perhaps without any distinct determination of its views, were agitating the nation; to minds heated with political contest they supplied cooler and more inoffensive reflections—they had a perceptible influence on the converation of the time, and taught the frolic and the gay to unite merriment with decency, effects which they can never wholly lose."

As Harold Routh in the Cambridge "History of Literature," in speaking of the *Spectator*, says: "It surpassed the *Tatler* in style and in thought. It gave expression to the *power* of commerce. For more than a century traders had been characterized as dishonest and avaricious, because playwrights and pamphleteers generally wrote for the leisured classes, and were themselves too poor to have any but unpleasant relations with men of business. Now merchants were becoming ambassadors of civilization., and had developed intellect so as to control distant, and as it seemed, mysterious sources of wealth; by a stroke of the pen and largely through the coffee houses they had come to know their own importance and power."

Great as was the glory of the political and literary coffee houses of the day, we turn with no less interest to their mercantile contemporaries and the institution which they brought into being. Among the names of well-known masters of such, gathered from public advertisments of the day, are Hain's, Garaway's, Thomas Good's, Elford's, Farr's and, most notable of all, Lloyd's. Their fame in many instances outlived the lives of their founders. Garraway's, born in the middle of the 17th century, did not die till after the middle of the 19th, but Lloyd's, his contemporary, still lives and grows.

The Great Lloyd's Insurance Company Founded in Coffee Houses.

"Not for an age, but for all time" (at least let us hope so). Not with a flourish of trumpets, but unobtrusively and without record it came into being. All we can with certainty say is that it was already established in 1688, for we read in an advertisment in the London *Gazette* of Feb. 18, of that year that 'On the 10th inst a middle-seized man, having black curled hair, pock-holes in his face, an old brown riding coat and black beaver hat, was suspected to having taken away five watches and sundry other articles of silverware from his master, and that whoever gives notice of them to Mr. Edward Lloyd at his Coffee House in Tower St. or to Mr. Edward Bransby in Darby shall have a guinea reward.'"

"There can be no doubt," says Frederick Martin, the historian of Lloyd's, "that the Coffee House in Tower Street, here referred to formed the small seed from which sprang the greatest marine insurance corporation in the world, and that Mr. Edward Lloyd, owner of the coffee house, was the founder and name-giving god-father of Lloyd's."

Tower Street was then, as now, the resort of sea-faring men, merchants and men connected with shipping. John Stow, in his *Survey of London*, describes it as forming "a spacious street, well built and inhabited by able tradesmen, and the rather so as being so great a thoroughfare to and from Wapping, the Tower, St. Katherine's, and those parts bordering on the Thames, replenished with seafaring persons." Mark Lane was then more appropriately called Mart Lane, and Mincing Lane was Mincheon Lane, so called because of the property in it belonging to the "Minchuns" or "Nuns" of St. Helen's in Bishopsgate Street.

Edward Lloyd remained in Tower Street till 1692, when he removed to Lombard Street and set up his coffee house at the corner of Abchurch Lane, a few doors from the General Post Office and in the very centre of the mercantile life of London. The shipping connection he had made in Tower Street doubtless followed him, and was greatly added to. The London *Gazette* for October 20, 1692, shows that the spread of coffee houses had already reacted as far as Plymouth, for there may be read the following advertisement, which also introduces us to the curious custom of auctioneers accepting no bids after an inch of candle has burned away:

"On Tuesday, the 8th of November next, at Bennet's Coffee House in Plymouth will be exposed to sale by inch of candle, three ships with all their furniture; the names whereof are the *Teresa*, the *St. Thomas* and the *Palm*, two of 400 tons, and the other 100 tons. The inventories thereof are to be seen at Lloyd's Coffee House in Lombard St., London."

Other advertisements of a similar character show that gradually after this period Lloyd's Coffee House became more and more the resort of persons connected with shipping, and that there were regular sales of vessels, more numerous than those previously held at John's Coffee House, the revelry of which was not long sustained. That the rise of his coffee house was due to Edward Lloyd's personal activity and intelligence, which gathered round him a class of men largely profiting by the same was proved in the course of a few years by an event of special interest, the establishment by him of a weekly paper furnishing commercial and shipping news. This paper which may fairly be considered the first seed toward the rise of the great corporation bearing the founder's name, was called *Lloyd's News*, and commenced publication in 1696.

All the numbers of *Lloyd's News* bear the imprint at the end. "Printed for Edward Lloyd, coffee man, in Lombard St." Only 76 numbers were printed, and copies are now exceedingly rare, so much so that the great collection of newspapers in the British Museum possesses but one copy, and no complete set is known to exist, but the Bodleian Library at Oxford is the proud owner of all but the first seven numbers.

Lloyd's Coffee House continued to progress, and it is frequently referred to in contemporay notices at the end of the seventeenth century and its celebrity is attested to in a poem entitled "The Wealthy Shopkeepers," published in 1700, which has the lines:

"Now to Lloyd's Coffee House, he never fails to read the letters and attend the Sales."

The sales were of a most miscellaneous character, but a perusal of many of the announcements leads to the conclusion that our ancestors' eatables were home grown. Brandy and claret, indigo and cochineal figure largely, and prize ships are a frequent item. The first intimation of a sale of coffee by auction occurs in *The Postman* of Oct. 2, 1703, and reads as follows:—

"On Wednesday the 6th of this inst. October, will be exposed to sale a parcel of Turkey coffee at Lloyd's Coffee House in Lombard St. at 3 o'clock in the afternoon. Samples of the same may be seen at Lloyd's aforesaid, from Monday morning the 4th inst. till the time of sale by Will Brown, sworn broker."

In number 46 of the *Spectator* we get an amusing peep into the manners of the times and our first intimation of the auction rostrum or pulpit, as it is there called:

"About a week since there happened to me a very odd accident by reason of one of these my papers of minutes which I had accidently dropped

at Lloyd's Coffee House *where the auctions* are usually kept. Before I missed it there were a cluster of people who had found it, and were diverting themselves with it at one end of the coffee house; it had raised so much laughter among them before I had observed what they were about that I had not the courage to own it. The boy of the coffee house, when they had done with it, carried it about in his hand, asking every body if they had dropped a written papper; but nobody challenging it, he was ordered by those merry gentleman who had before perused it to get up into the auction-pulpit, and read it to the whole room, that if anyone would own it they might. The boy accordingly mounted the pulpit, and with a very audible voice read out the paper."

So Lloyd's continued to flourish. In 1726 the defunct *News* was replaced by *Lloyd's Post.* In 1774 they had outgrown the coffee house and migrated to the Royal Exchange under the name of "New Lloyd's Coffee House." At that time there were 79 members, brokers and underwriters, who each guaranteed the sum of 100 pounds. The old Lloyd's had been a proprietory establishment; the new was really a club belonging only to its members, but the subscribers, requiring a general manager, selected the head waiter, Thomas Fielding, and gave him the title already grown familiar by custom of "Master." So things progressed till 1804, when it became necessary for the committee to enter into a correspondence with the government regarding convoys, and other important matters. Letters being signed as usual by the "Master" provoked a curt reply from Earl Camden, Secretary of State for the Colonies and War Department, stating that he regretted not being able to enter into epistolatory intercourse with the "waiters" at Lloyd's Coffee House. This necessitated the appointment of a secretary, and association with the word "coffee" became a thing of the past.

COFFEE INTRODUCTION INTO AMERICA AND INTO CONTINENTAL EUROPE.

Coffee appears to have been introduced into Paris somewhat later than into London, and the first coffee house in Vienna was not till 1683, and in Berlin in 1711.

We have no definite chronicle of the opening of the first coffee house in America, but in Drake's "History of Boston" mention is made of the "London Coffee House" there, at which books were also sold in 1689.

Watson in his "Annals of Philadelphia" mentioned a coffee house in the neighbourhood of Front and Walnut Streets, at which a Common Council of the City was held in 1704. The first coffee house in New York was probably established as early as either of these, and in the report of the trial of Colonel Bayard, who was charged with high treason, mention is made of a meeting at the coffee house in 1711. In 1729 the New York *Gazette*, which was first published in 1725, contained its first reference to a coffee house, and in 1730 advertised a sale of land by public auction at the Exchange Coffee House. This was situated at the foot of Broad Street. The Merchant's Coffee House is first mentioned in 1743 and stood at the south-east corner of Wall Street and Water Street.

In 1762 Messrs. Rogers and Humphreys announced the opening of the Whitehall Coffee House, and that "a corresponcence is settled in London and Bristol, to remit by every opportunity all of the public prints and pamphlets as soon as published, and there will be a weekly supply of New York, Boston and other American papers."

In 1792 the Tontine Coffee House was built and was intended to afford new and more ample accommodation for the merchants, and particularly for the Chamber of Commerce. It was destroyed by fire in 1804.—*Simmons' Spice Mill.*

(To be continued).

RUBBER.

The present, well ordered, systematic and definite practices of agriculture in temperate regions are the result of centuries of slow development by generations of men who lived in the same country, often cultivating the same fields handed down from father to son.

Systematic *tropical* agriculture on the contrary is a thing of yesterday. With the single exception perhaps of cane farming,—which has been carried out on the same estates for over a century, and often under difficult conditions which have forced planters to study how to secure greater returns of sugar at the least expense, concerning which, consequently, there is much data available,—there has been on the contrary little definite knowledge to hand of other crops grown in the tropics until of late years, during which there has been accumulating some specific and precise ideas on the growing of tropical products.

The cultivation of bananas is of yesterday; the cultivation of cocoa of the day before; the growing of rubber is a thing of the present hour. No tropical product has ever created more interest and excitement during these last few years than rubber, and most of the knowledge commonly known concerning the various rubber trees and the production of rubber has been of the text book order. But perhaps more practical and scientific men have devoted a closer attention to this product than to any other product of late, and more has become known about the growth, cultivation, tapping, and especially the curing of rubber within the past few years than was before.

But by far the closest attention has been devoted to Pará Rubber, because it is the rubber of the great estates in the East, where enormous capital has been invested, and where the conditions of trade and tenure of land are stable and secure, unlike the conditions in Central America where Castilloa Rubber is the indigenous rubber tree of the forests.

We know little about the rubber (Castilloa), comparatively speaking; there is little definite knowledge about the different varieties; those interested, as we are here, are still experimenting with methods of tapping; there is not yet a tapping implement that we can call satisfactory; we know little about the coagulating process.

It must be remembered that the nature of the Castilloa tree is very different from Pará; the bark is different; the latex flows differently, even in the different varieties of Castilloa and under different conditions, such as age of trees and climate, apparently; methods of tapping are different, the tapping tools to be used are different, the latex coagulates differently. A Parâ Rubber tree gives latex or only a mere trifle at the first tapping; it is a tree that requires to be treated something like a milch cow; and when the latex begins to flow the trees have to be tapped every other day; one tapping test is absolutely of no use whatever. On the other hand the latex of Castilloa oozes or flows freely according to variety, age of trees, conditions of climate and soil,—and one tapping every three or four months is enough. What we then have been trying to do is to get knowledge, but the tapping tests made here have not, through force of circumstances, been systematic, or made at regular intervals so that we are not able to say what months are best to tap. What we have established, however, is that Castilloa trees are in the main very healthy; and more so than almost any other economic tree, so far it grows freely without cultivation on soils not suitable for bananas, and where cocoanuts cannot be profitably grown, in back lands, on clay soils, to some elevation,—1,600 feet at least,—that although our tapping tests have not been carried through in the early morning or late in the afternoon, as is set down as giving the best results, the tapping results have

been very promising, and the cost of tapping, putting the wage of a skilled tapper at 2/6 per day, is from 4d. to 6d. All this applies to Castilloa Rubber.

As we have said, the whole process of tapping Hevea rubber trees is different. We have only lately had the special tools imported, and with these only one trial of a few minutes has been made. With these, the tapper will first require to experiment until he can use them properly; secondly he will have to spend a week at least among the trees; and, although we are anxious to settle whether Pará Rubber will be as good or better than Castilloa for our conditions, or not likely to be profitable at all, this will take time, the services of an Instructor at present cannot be spared even to continue systematic tests on the more common Castilloa Rubber.

Altogether Rubber-growing here is still in an experimental stage, and while we have some data as regards Castilloa, we have none yet as regards Pará.

Pará Rubber.—With reference to the tapping of Pará Rubber, I recently met a gentleman from Trinidad who informed me that he had a good deal of experience of tapping it, and owned a small plantation.

He informed me that even in the very best of trees (Pará) the initial tapping yielded practically no latex, and that it was only by persistent tapping, repeated at regular intervals, that the trees yielded latex, but that trees which at first apparently contained not a drop of latex afterwards yielded splendid results.—*The Journal of the Jamaica Agricultural Society.*

W. CRADWICK.

Sub-Soiling and Dynamite.

We are convinced that dynamite will be very useful to us here, and will do for us economically what no implements can do for us at all, under some of our conditions of soil. We have a great many soils that have 3 or 4 inches of a good loam on the top, but below have a stiff yellow or red clay, the latter the worst, and these are often unploughable lands where a sub-soiler could not be used. They are not first class soils, or even very good soils, so far as we in Jamaica judge soils; but in most other countries they would be accounted good soils; chemically they are all right; but they are compacted, and though not actually sour are inclined to be. What they need is aeration, opening up, and it is not wise to bring the sub-soil to the top and bury the top soil as is done in the forking ordinarily done. We have seen such soils cultivated by forking for the first time after lying long fallow, actually giving such poor results that the tenants, with their hoe cultivation, only turning up three inches,—all good surface soil and rich in humus,—had better results in growing corn and peas, and so they did not think much of the forking process, which was laborious, compared to their hoe chops.

Now light forking of such soils, with a breaking up of the sub-soil with dynamite, would we think be a good practice, likely to yield good results.

* * * * *

Then again take the numerous cases of established tree products growing on first rate soils, some alluvial, some deep heavy loams; some with a thin loam on surface and good rich clay below. Trenches open up these soils to a large extent, liming sweetens them, but there are cases where in spite of these there is evidently from the condition of the trees with no known causes above to account for their lack of thriftiness, something wrong below.

Now small charges of dynamite, at frequent intervals between the rows of the cocoa or cocoanut trees, *might* be the means of opening up the stiff compacted sub-soil more effectively than the trenches. Certainly the experiment is worth trying.—*Journal of the Jamaica Agricultural Society.*

CORRESPONDENCE.

Labour Commission.

Peruvanthanam Estate,
Mundakayam, 13—6—14.

THE EDITOR,
The Planters' Chronicle,
Bangalore.

Sir,—It is not so long ago that you cordially invited planters to contribute to your correspondence columns, and it has all along been understood that the Labour Commission was freely open to discussion. I wrote a short letter of a dozen lines pointing out an error (as I considered it) of figures only, and in this letter I carefully refrained from criticising the proposed Labour Commission. This letter has unfortunately drawn down the wrath of Jove (or should it be Homer), and the accusation of Zoilism upon my head. Your attitude does not encourage timid correspondents. However I owe you an apology. I regret the use of the objectionable word "juggle" and I would withdraw it.

As regards the figures I wished to emphasise. I refer you to page 77 of last year's Book of Proceedings, when Mr Macrae drew attention to the fact that there are plenty of planters employing labour who do not belong to the U. P. A. Mr. Hamilton and Mr. Richardson gave this consideration at that time. Mr. Richardson himself would be able to inform you that the severest competition met with in Peermade District in from men who have not joined the P. A. I was endeavouring to draw attention to the fact that the large body of men outside the U. P. A. are not a negligeable quantity and their acreage should be taken into account in taking a plebiscite of S. Indian planters.

I purposely still refrain from any criticism of the propsed Labour Commission, except to emphasise Mr. Mead's point that Rubber is in a totally different position to Tea, and in a few years one cooly will probably suffice for eight acres. So Tea and Coffee planters must try and forgive us if we 'gang oor ain gait.'

I would now ask three questions, which do not merit reply if they taste Zoilean:

(1) Was the 100,000 acre minimum the result of months of intense application, or did the K. D. H. P. Coy. stipulate for this figure?

(2) Has the seventh para. of the report of the last South Travancore P. A. Meeting any bearing on many Travancore Planters' attitudes?

(3) Is the "Planters' Chronicle" the official organ of the Labour Commission, or of the U. P. A. S. I.?

Finally, Sir, I consider I am far too small an atom to be struck by Homeric wrath. *Aquila non capit muscas.*

Yours faithfully,
H. B. KIRK.

13th June, 1914.

Labour Commission.

THE EDITOR,

Planters' Chronicle.

Sir,—I have just been reading Mr. Mead's last criticism of the Labour Commission. There certainly is a lot in what Mr. Mead *says*, but I cannot help asking myself "why does he not *do* something"? Why not try and start a West Coast Agency such as he mentions? Criticise it as he may, the Labour Commissions have undeniably *done* something. They are making an attempt to solve the Labour problem: and their opponents are *doing* nothing, only talking. And surely the latter cannot say there is no need for action. Will they tell us what they are going to do if the Labour Commission does not go through? Isn't it worth trying?

Personally it seems to me a statesman-like proposition in theory, anyway, and there appear to be some of the most capable and best known planters in S. India on the proposed Labour Dept. Committee, and, failing any other scheme (and there seems to be none such) it is surely worth a trial, to say the least, although I think there is much more to be said in its favour than that.

Does Mr. Mead mean to imply—I think he does—that Mr. Richardson's present agency is not worth the money it costs, and that it will cost less if put into the Labour Department? Mr. Richardson can speak best as to the latter point, but I know something about the former, and am quite certain the Agency gives good value for the money, and I should like to see the figures comparing the advances per head of estates belonging to the Agency, and of those who do not so belong, *in the same district*. I have no doubt these would be in the Agency's favour.

Anyway, in the case of Mr. Richardson's agency, too, we come back to my original point of "deeds not words" and—Mr. Richardson has started and successfully run an agency of his own. What has Mr. Mead done? The Labour Commission proposes to do a good deal and has already done a lot. What have their critics done except "sit on the fence"?

Yours faithfully,

DEEDS NOT WORDS.

A Suggestion.

The EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—I have been looking through "Rutherford's Planters' Note-Book," and, useful book though it be, there is no getting over the fact that it is intended for Ceylon, and not for S. India. A "S. Indian Rutherford" would supply a long felt want, would it not? Personally speaking, it certainly would; points are always cropping up on which a good reference book would enlighten one. Could not the *Planters' Chronicle* get to work and bring out such a book—or failing this could it not supply information privately, making a charge for doing so?

Yours faithfully,

"KNOWLEDGE IS POWER."

Labour Commission.

We publish the following Telegrams and letter from the Executive Committee to the Chairman of Councillors strongly recommending that the Labour Departments shall be started on the acreage secured :—

COPY OF A TELEGRAM DATED 18TH JUNE FROM MR. C. E. ABBOTT, TO THE SECRETARY, U. P. A. S. I.

"Executive Committee are sending recommendations to start depart-
"ment 1st July on present acreage for publication in *Chronicle*,
"—Abbott."

COPY OF A TELEGRAM DATED 19TH JUNE FROM MR. E. L. MAHON, CHAIRMAN, U. P. A. S. I. TO SECRETARY, U. P. A. S. I.

"Kindly publish in this *Chronicle* Executive Committee sanction
"starting of Labour Department on acreage already secured.
"—Mahon, Chairman."

To

Meppadi. 18th June, 1914.

The Chairman and Councillors
of the U. P. A. S. I.

Gentlemen,—At the Meeting held in Bangalore on 11th and 12th March last the following resolutions were passed :—

(1) "That this Association agrees that the recommendation of
"the Executive Committee be accepted and that the Labour
"Department be started on an approximate acreage of 100,000
"at Rs.2/- per acre annum."

(2) "That as it is decided that the Labour Department shall be
"started on the 1st. July next, it shall be considered that the
"scheme shall not have succeeded if sufficient support is not
"forthcoming by that date."

Since than as, you are aware, nearly 90,000 acres have promised support to the proposed Labour Department. We now strongly recommend that the Department be started on the acreage secured. (89619·41 acres. Ed).

It will be remembered by the Delegates at the Meeting that in the discussion which took place that it was generally considered that 85,000 acres would be sufficient to start on, for it was felt certain, that once a start were made, the remaining acreage required would be quickly forthcoming ; and now, from information received, we have reason to believe that this will be the case.

We have reached a total of 89,619·41 acres. This means that a sum of Rs.176,148—(£11,743-4-0) annually has been subscribed by by the Planters' of South India for 5 years. In our opinion this furnishes an absolute proof, if any were wanted, that the Department is a necessity ; and we further consider it a sufficient reply to those non-subscribers who continue to criticise some of the details of the scheme which was unanimously agreed to at Bangalore. It should be recalled that before the scheme as it now stands had been fully discussed, we had, after five months work got in only about 30,000 acres of definite support for one year. The immense increase now recorded shows that putting the Department on a thoroughly business footing has been approved of.

Yours faithfully,
The Executive Committee,
per, C. E. ABBOET.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 26.] JUNE 27, 1914. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Labour Barometer this week has risen to 90,219'41 acres ; and we have hopes that the remaining nine thousand and odd acres will yet come in, after reading the correspondence, we published on page 382 of last week's *Chronicle* from the Executive Committee strongly recommending that the Department be started on the acreage then secured. In connection with this subject the Secretary of the Association earnestly appeals to all Honorary Secretaries of District Associations to send up with their Delegates accurate and detailed lists of Estates and acreages supporting the Department. Absolute accuracy is most essential.

We publish the proceedings of the District Associations of Wynaad, Bababudin and Coorg; and in connection with the para. in the latter's proceedings we print a valuable and interesting note on Green Scale written by Mr. Bainbrigge Fletcher, Imperial Entomologist, after his recent tour in Coorg. The Life History and Control will no doubt be found the most interesting portions of a very valuable contribution.

We continue to publish another instalment on the Commercial Aspect of Coffee.

Under the heading of Soil we reproduce a paper written by Mr. A. Howard, Imperial Botanist, distributed to members at the last Coimbatore meeting.

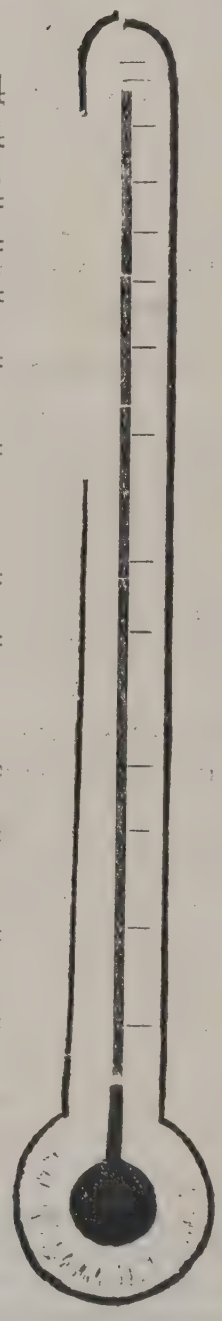
Our Correspondence columns are very full, mostly dealing with the Labour Department and supporting its establishment. The matter is dealt with from varying aspects but all arriving at the same conclusion for valid reasons. One correspondent has favoured us with an Extract from the *Financier*, which we publish for further information.

We mentioned that there was a Gymkhana Race Meeting on the 4th and during the meeting the Annual Assault-at-Arms will be taking place. The Race Meeting commences on July 14th. The Annual Meeting of the U. P. A. commences at the Mayo Hall on Monday, 6th July.

BAROMETER

OF

Labour Department.



"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association

Proceedings of a General Meeting held at Meppadi Club, on June 10th, 1911.

PRESENT.—Messrs. Bownass, Malcolm, MacLeod, Milton, Parker, Whitton and Abbott (Hony. Secretary). *Visitors.*—Messrs. Blackham and A. K. Simpson.

Mr. MacLeod in the Chair.

1892 PROCEEDINGS OF LAST MEETING.—Read letters from Chairman and Honorary Secretary, South Mysore P. A., in reply to this Association's congratulations on their Jubilee Celebration.

1893. THE LATE MR. M. D. TAYLOR.—It was unanimously resolved that the Honorary Secretary write to Mrs. Taylor to express the regret of the members of this Association at hearing of the death of her husband and to assure her of their sympathy.

1894. THE U. P. A. S. I. MEETING.— Mr. Abbott was elected Delegate. With regard to the *Labour Department* he was instructed to emphasise the fact that the Department is under the control of the U. P. A. S. I.

1895. S. I. P. BENEVOLENT FUND.—The meeting agreed that certain rules of the S. I. P. B. Fund require amending and defining.

1896. SCIENTIFIC DEPARTMENT. Resolved that this Association agrees to the proposals made at the meeting of the U. P. A. S. I. in March.

1897. VISIT OF THE GOVERNOR OF MADRAS TO MALABAR.—The Honorary Secretary was instructed to enquire if his Excellency intended to pass through Wynaad.

1897. ROADS —Complaint was made of the state of some sections of the D. P. W. Road between Vayitri and Sultan's Battery. The Honorary Secretary was instructed to address the Executive Engineer.

1899. ATTESTING COOLIES' CONTRACTS.—Read G. O. 1031 Judicial dated May 2nd, 1914, appointing certain officials in S. Canara to attest contracts. Read correspondence.

Proposed by Mr. Whitton that Government be asked to also appoint Monegars and Village Munsiffs to attest contracts as in Coimbatore. (See G. O. Judicial No. 612 dated May 10, 1909). The Honorary Secretary was instructed to address Government.

1900. MEPPADI POST OFFICE.—Read letter from Honorary Secretary asking that this office should be open from 6 A.M. to 6 P.M. and the reply from the Superintendent of Post Offices, Malabar Division, promising to do this. The Honorary Secretary was instructed to thank Mr. Recketts.

1901. LADY AMPTHILL NURSING INSTITUTE.—Read letter from Honorary Secretary, Central Travancore P. A., asking us to support his proposal that the Planting Member of Council should be on the Committee of the Institute. As this Association does not subscribe, it was resolved that we cannot interfere in the matter.

1902. PUDUPADY HOTEL.—Approved of grant of Rs.50 for repairs. It was resolved to pay Mr. C. Sangaran a further sum of Rs.30 to repair the stables on the work being completed to the satisfaction of the Association.

1903. PLANTING EXHIBITION.—Members are reminded that this will be held at the U. P. A. S. I. Offices; and that Exhibits should be sent on not later than July 1st.

A vote of thanks to the chair terminated the proceedings.

(Signed) D. H. MACLEOD,
Chairman.

(„) C. E. ABBOTT,
Honorary Secretary.

Bababudin Planters' Association.

Proceedings of a Quarterly General Meeting held at the Kadur Club, Chikmaglur, on June 10th, 1914.

PRESENT.—Messrs. H. Allardice, A. B. Boyd (President) A. C. W. Denne, F. Hugonin, H. Kerr, R. D. Lovett, H. W. Raikes, W. R. Thomson, H. Watson and S. H. Dennis (Hon. Secretary).

The Minutes of the last Meeting were read and confirmed.

I. *Co-operative purchase of manures.*—The report of the Sub-Committee appointed to go into this matter was read by Mr. Denne.

A vote of thanks to the Sub-Committee for all the trouble they had taken was proposed by Mr. Lovett and seconded by Mr. Watson and carried.

II. *Lady Ampthill Nurses' Institute.*—A letter from the Hon. Secretary, Central Travancore Planters' Association, dated 11th April, 1914, was read and after some discussion the following proposal was brought forward by Mr. Boyd and seconded by Mr. Denne and carried:

That, as this Association does not subscribe to the L. A. N. I., it does not feel justified in supporting the Central Travancore Planters' Association proposal.

III. *Election of Delegates to U. P. A. S. I. Meeting.*—Proposed by Mr. Hugonin and seconded by Mr. Denne: that Messrs. Boyd and Dennis represent the Association at the forthcoming Conference.—Carried.

The preliminary Draft Agenda Paper was then gone through to enable the Delegates to know the opinion of the members on the different subjects to be brought up.

The meeting terminated with the usual vote of thanks to the Chair.

(Signed) A. B. BOYD,
Chairman.

(„) S. H. DENNIS,
Honorary Secretary.

Coorg Planters' Association.

Minutes of a General Meeting held in Mercara on 11th June, 1914.

PRESENT.—Messrs. E. L. Mahon (Chairman); A. J. Wright, F. Macrae, C. Elsee, Talbot Cox, H. T. Shaw, J. A. Graham, C. G. Maclean, H. M. Mann, H. R. Ellis I. C. S. (Commissioner of Coorg); P. G. Tipping (Honorary Secretary).

Read notice convening the meeting.

Read and confirmed Minutes of last General Meeting, held at Pollibetta on 26th March, 1914.

Read Honorary Secretary's Report.

ANNUAL REPORT OF THE COORG PLANTERS' ASSOCIATION, 1913.

Mr. Chairman & Gentlemen,—Having but recently taken over the office of Honorary Secretary, after an absence of some 8 months from the country, I can place only a meagre report, gathered from available data, before you.

Membership.—During the past season it has been our misfortune to lose 2 of our members by death, and another has left the country for good, new members have joined our Association, some very recently, so we now have a membership of 66. There are only 4 subscriptions in arrears, (1 has since been paid). Copies of the accounts brought up to the 31st of May, are on the table. With the exception of a small account for printing, I am not aware of any outstandings. A good stock of necessary stationery has just been laid in. The account for the year shows a credit balance of Rs.56-10-11.

Scientific Officer and his Assistant.—There is a general feeling that the Scientific Department should be taken over by the Government of Madras, but nothing has as yet been settled. The Mysore Durbar have increased their present contribution of Rs.1,000 to Rs.1,350 for a period of 5 years, on the understanding that they are furnished with reports of the work done by the Scientific Officer, and that he will co-operate with their scientific department, in making his experience available to Indian planters in Mysore.

The Assistant Officer for Coorg, as all subscribers to that fund are aware, left us at the end of 1913. The question of appointing a successor is held in abeyance. The Government of Coorg have kindly consented to hold their annual grant to this fund in abeyance pending settlement of the matter. I might mention for the information of those members of this fund who are present, that all calls up to the end of 1913, with two exceptions, have been paid.

Roads and Communications.—No complaints have been received lately, except with regard to the Coorg-Malabar road; letters were sent to the Collector of Malabar, also the Chamber of Commerce, and to the several curing firms, regarding same, a good deal of correspondence and some repairs was the immediate outcome of this. This correspondence is laid on the table and our best thanks are due to the Chairman and Malabar Chamber of Commerce, for so strongly supporting us in this matter. Within

the Province much progress has been made. The Sidapur-Pollibetta road is now opened from end to end, and though it needs a Monsoon to settle it down, it is already being used to some small extent. The estimate of Rs.8,000 for further work on this road, and of Rs.9,000 for widening and improving the Pollibetta-Gonicopal road have been sent in. The Sidapur-Suntikoppa road has been greatly improved, and only needs the sanctioned bridge or a causeway across the Chickle hole to make it passable for wheeled traffic throughout the year. A temporary footbridge is very necessary here, the crossing is bad at any time, dangerous in the Monsoon, the fallen tree which enabled foot passengers to cross having been swept away last monsoon.

LABOUR DEPARTMENT.—Your Delegates to the extraordinary meeting of the U. P. A. S. I. held in March, being much impressed with apparent need of such a department and the combination of all planters, to check and regulate fraud, advances and irregularities, gave the assurance of support from 8,000 acres; since then all members and others have been circularised, resulting in a total acreage of 15,502 supporting the scheme.

PLANTERS' BENEVOLENT FUND.—Under this heading there are 33 members, some of these being life members; amongst the annual subscribers there are 5 in arrears during the year. The U. P. A. S. I. COUNCIL sanctioned Rs.300 towards the fund raised to help Mr. H. Marriott to Canada.

GREEN BUG.—This pest has apparently gained a foothold in the Province. It can safely be said that all members of the Association have taken it seriously and are making every effort to check it. The Commissioner of Coorg has appointed officers of the Agricultural Department to inspect and report on Indian holdings, and with good monsoon rains, Nature should put a heavy check on it.

The accounts have been audited by your Committee and found correct; and I now ask you to pass them, and tender my resignation.

(Signed) P. G. TIPPING,
Honorary Secretary.

Accounts were laid on the table. Proposed by Mr. Graham and seconded by Mr. Mann that the accounts be passed.—Carried.

In this connection it was pointed out by the Honorary Secretary that the grant sanctioned last year for Delegates T. A. had not been paid, and the Honorary Secretary was authorised to pay same out of "Emergency Fund."

Result of Ballot.—Mr. J. A. Graham, President, Mr. P. G. Tipping, Honorary Secretary.

Members of Committee—

North Coorg—Messrs. C. G. Maclean, H. M. Mann, H. C. Wood, Talbot Cox, G. R. Pearse, C. Elsee.

South Coorg—Messrs. H. G. Grant, F. Macrae, E. L. Mahon, W. A. F. Bracken, F. W. Gerrard, J. Hume.

Roads.—Read Correspondence *re* disgraceful state of the Coorg-Tellicherry road, beyond the Coorg frontier. The meeting noted with satisfaction that some repairs were being done, but regretted that these were not sufficient to save the inspection car, driven at a speed of 10 miles

per hour, from a broken spring, and instructed the Honorary Secretary to point out that Motors and their speed are beside the question. The complaints being the outcome of complaints made by cart contractors, of broken carts and damaged produce, and demands for higher rates. the Honorary Secretary was further instructed to convey the Meeting's thanks and appreciation to the Chairman and the Malabar Chamber of Commerce for their support and co-operation.

Coorg-Mysore road.—It was resolved that the attention of the Government of Mysore be drawn to the state of the roads between Mysore and Coorg frontier. It is noticed with satisfaction that metal is being collected, and that one of these roads has already been considerably improved, and this Association hopes that the Government of Mysore will see that the very necessary repairs are completed during the present monsoon.

Subscriptions.—Proposed by the Hony. Secretary and seconded by Mr. Mahon that the various subscriptions be brought into line, June to June, and that the third call S. O. A. fund be carried forward in payment of 1914-15 subscription to U. P. A. S. I. and Emergency Fund account.

Read District Magistrate's letter *re* Subedar's visits to Pollibetta, and it was decided that the last Monday of each month was the most convenient date for those visits.

The date of the next General Meeting was fixed for 28th August at the Bamboo Club.

Mr. Mahon proposed a hearty vote of thanks to Mr. Tipping for relieving the late Honorary Secretary and for again consenting to act.

A hearty vote of thanks to the Chair terminated the Meeting.

(Signed) P. G. TIPPING,
Honorary Secretary.

MANURES AND FERTILISERS.

By Homer J. Wheeler, Ph. D., D. Sc. Pp. xxi + 389, Crown 8vo. (New York: The MacMillan Co., 1913.) Price 7*s* net; post free, (United Kingdom 7*s*, 5*d*. abroad 7*s*, 9*d*).

This volume is written by an author who has been associated with the experimental side of his subject in the capacity of Director of the Agricultural Experiment Station of the Rhode Island State College, U. S, A., and with the manufacturing side as chemist to a manure factory in the United States. Methods of manufacture are not discussed in full, but consideration is given to the composition and effects of practically all substances used as manure, the more important of these being considered in detail. Farmyard manure is fully dealt with, not only as regards its composition, storage, and use, but also as regards its organisms and the influence of these on soil fertility. The influence of lime on soil is adequately considered, and the chapters on the manurial effect of magnesium and sodium salts are of interest. The value of the book is enhanced by the frequent references to original work, particularly that carried out at the Rhode Island Agricultural Experiment Station.

The book is arranged in a manner very convenient for reference and should prove of value both to agricultural students and to the practical farmer.—(*Bulletin of the Imperial Institute*).

GREEN SCALE.

Note on the Green Scale of Coffee (*Lecanium viride*).

The Green Scale, its appearance and damage done by it.—The Green Scale (*Lecanium viride*), sometimes known as the Palni Bug because it was first found in India on Coffee in the Palni Hills, is a small, flattened, oval, pale green, scale-like insect which when full-grown is about an eighth of an inch long. In its early stages it is indistinguishable from another green Scale-insect, *Pulvinaria psidii*, which is especially common on guava, and which has occurred in moderately small numbers on coffee in Coorg for many years past; the full-grown Green Scale is, however, recognisable by a narrow black line, irregular in shape but always much bent and usually forming a mark like a hair-pin or horse-shoe, which occurs on the black (upper surface) of the Scale. Green Scale is generally found near the tips of the branches, either clustered in masses along the tender parts of the twigs or on the leaves, on which it especially affects positions alongside the mid-rib and veins of the leaf. It damages the plant by sucking the juices by means of its very fine, thread-like mouth-parts which it thrusts into the plant's tissues; when this Scale is in large numbers the drain of plant-juice is very large, and therefore causes great injury to the plant, which cannot be expected to produce a good crop if it is weakened in this way. In very bad cases the plant may even be killed outright. The presence of this Green Scale is therefore highly detrimental to the planters' hopes of even an average outturn of crop, and in some districts (such as parts of the Nilgiris), which it has invaded, this seemingly insignificant insect has so damaged the coffee-bushes that whole estates have had to be abandoned. It is therefore extremely important for every coffee-planter in Coorg to make himself acquainted with the appearence of this pest and to take every possible means to prevent its increase, to injurious numbers, on his coffee-bushes.

Introduction, distribution and means of dispersal—The Green Scale was first noticed in Coorg about a year ago and has now spread practically throughout North and South Coorg, having been found at Somwarpet, Suntikoppa, Sidapur and Pollibetta. There is no doubt whatever that it is a recent immigrant into Coorg, and that it is still spreading and undoubtedly will spread to all Coffee Estates. The young Scale, which is a minute, six-legged animal just visible to the naked eye, is able to move about fairly actively and wanders about for some time in search of a suitable place to settle down and suck the juices of the plant; and in the course of these migrations it may wander from one bush to another, especially when these are touching one another, as coffee-bushes usually are. The Scales are also carried about by various kinds of ants which are very fond of the sweet excretion ("Honey-dew") yielded by the the Scale-insect; for this reason ants are usually seen attending the Scales, licking up the honey-dew and protecting the Scales from enemies. The presence of ants on coffee-bushes is frequently a sign of the presence of Scales, either Green Scale or other species. When the honey-dew falls on leaves a black fungus grows on it and the appearance of this black, sooty deposit on the coffee-leaves should also lead to examination for the presence of Green Scale, though it is not necessarily connected with Green Scale, and is often caused by the presence of other sucking insects on the shade-trees. When it is first found in a new locality the Green Scale is often discovered in a very limited area (a single bush or a few bushes), often far removed from paths or traffic, and it seems probable (though not proved) that the young Scales may be carried

by birds or other animals which frequent infected areas and than go to hitherto-uninfected ones. Young Scales may also perhaps be carried by the wind, as on leaves whirled up into the air by a gust of wind, or on the clothing of any persons walking through infected areas. The direct carriage of living Scales on plants or any parts of plants is also an obvious method of dispersal and the utmost care should therefore be taken in importing plants into any localities in which the Green Scale has not yet been found.

Life history.—The exact length of the life-cycle of the Green Scale has not been worked out in Coorg, but it is probably quite short—a month or less. An important fact is that every Scale is a female which is able to reproduce without the aid of a male—indeed, the male of this Scale is not known to occur. When the Scale is full-grown, eggs are formed and hatch inside the body, the young insects escaping and crawing out from under the body of their parent. They wander about for a little time and then fix themselves in one spot on a leaf or twig, commence sucking the juices of the plant and grow until they are adult, when each individual develops eggs and produces a further batch of young. The increase is therefore extremely rapid and the progeny of a single young Scale will in the course of a few months at most be sufficiently numerous to cover all the leaves and twigs of a whole bush, whose juices are then drained to a very serious extent.

Control.—No practical means for the actual extermination of this pest has yet been found, and it is now so widely distributed that extermination has become impossible. What can be done, however, is to keep it in such small numbers as to minimize the damage done as far as possible. It can be controlled, and estates which adopt a policy of control immediately the Green Scale obtains an entry should have little to fear from it, whilst those estates which allow it to spread unchecked may find too late that it has injured the coffee-bushes to such an extent as to render them useless. In this case, as in others, "Prevention is better than cure."

The best means means of control is by the application of a contact insecticide, that is to say, of some substance which will kill the insect when it touches it. The most satisfactory insecticide for Scales of this sort is Rosin Compound, which is made as follows:—one pound of ordinary washing soda is boiled in one gallon of water, and to the boiling solution are added two pounds of finely-powdered fir-tree rosin; the boiling of the solution is continued adding small quantities of cold water at intervals, until the liquid (now about three gallons) becomes clear and thin, like clear coffee. This is diluted to about one part of rosin compound to six of water; it is better to make the dilution* whilst the stock mixture is still hot. The addition of soap makes the mixture more effective, but is not necessary for killing the Scales by spraying; for brushing, however, sufficient soap must be added to give the requisite lather. Fish-oil soap, if obtainable, is far preferable to ordinary hard soap for use against insects. The diluted liquid may be applied with a spraying machine, care being taken that the spray reaches all the colonies of Scales on the bushes treated; the under-surfaces of the leaves must therefore be given special attention. The use of pressure sprayers is strongly advocated for efficient working. It may be noted that sprayers are only labour-saving machines used for the distribution of the spray-liquid; for large areas it is far more economical to use sprayers than to apply the liquid by hand by means of brushes. Brushing is probably equally efficient so far as regards killing the Scales, but is much slower; it is

therefore best used in small areas, as in the case of small holdings whose owners require to do the work themselves, and cannot afford io buy sprayers.

Pruning of affected bushes, the prunings being burnt *on the spot* (and not carried elsewhere, with the risk of infecting all bushes past which they are carried) has been tried on some estates, as has also the burning of the Scales on the bushes by means of a blow-lamp, but both these methods spoil the bushes without being efficient, and cannot be recommended,

In any case, whatever method is adopted, some of the young Scales are sure to escape destruction, and a single young Scale is able to start a new infestation. The infected area should therefore be treated a second time, after an interval of a week, to catch any young Scales which may have escaped the first treatment, and thereafter be kept under observation.

For Estates which are already infected I would advise that a small permanent gang of coolies be kept on the special work of looking out for all badly-infected bushes or areas, and promptly treating them by spraying or brushing.

The ants, which protect and spread the Green Scale-insects, also require repression, and endeavours should be made to destroy their nests as far as possible by burning them, or tearing them open and spraying.

Natural enemies.—The Green Scale seems at present fairly exempt from attack by other insects or animals in Coorg. Further attention will be directed to this point. In the prolonged period of wet weather during the south-west monsoon, however, the Green Scale-insects are attacked by a whitish fungus which destroys a very high percentage of the insects. This fungus checks its increase very considerably for the time being, but does not exterminate the Scale altogther. It is not practicable to grow this fungus artificially on a largs scale, but it is practicable to take branches containing the fungus, and to place them in bushes infected by Green Scales on which the fungus has not yet appeared. During the rainy season, when this fungal disease is found to be present, it will probable be found necessary to take active control-measures by spraying.

Food plants.—Hitherto the Green Scale has only been found on coffee in Coorg. It may, however, attack other plants and will probaly spread into various shade, jungle and ornamental trees and plants in the future.—Guava, Loquat, Cinchona, Citrus (Orange, Lime, Pomelo, etc.) are all common food-plants, and the likelihood of their infestation by that scourge must not be overlooked.

T. Bainbrigge Fletcher,

Imperial Entomologist
to the Government of India.

Camp: Polibetta, Coorg.
Dated 19th May 1914.

* The amount of dilution here given is that generally found sufficient, but the exact amount must depend very largely on the quality of the materials used, and can only be found by experience in each case. Too weak a strength will not kill the Scales, and therefore represents money and labour wasted; too strong a dose may harm the bushes and will not kill the Scales any "deader" than the correct proportion, besides wasting the extra amount of insecticide used. The *soda* is only required to dissolve the rosin, and only sufficient to do this should be used.

COFFEE.

The Commercial Aspect of Coffee.

(Continued)

Coffee in Literature.

Reverting to London and to literature, it is interesting to note that probably the most familiar poetic lines concerning coffee, written by Pope in 1712,

"Coffee which makes the politician wise,
And see through all things with half shut eyes"

are much more interesting and luminous when taken in conjunction with their context. The scene is a fashionable drawing room, and after description of the card tables and the players,

"For lo! the board with cups and spoons is crowned,
The berries crackle, and the mill turns round,
On shining altars of Japan they raise
The silver lamp; the fiery spirits blaze;
From silver spouts the grateful liquors glide;
While China's earth receives the smoking tide;
At once they gratify their scent and taste,
And frequent cups prolong the rich repast.

Straight hover round the fair and airy band;
Some, as she sipped, the fuming liquor fanned,
Some o'er her lap their careful plumes displayed,
Trembling and conscious of the rich brocade.
Coffee (which makes the politician wise,
And see through all things with his half shut eyes)
Sent up in vapours to the baron's brain
New stratagems, the radiant lock to gain."

Here we clearly see that it was high fashion not only to make, but to grind the coffee in the apartment.

At the end of Queen Anne's reign, 1714, the "coffee men" had been obliged to raise their prices owing to the increased taxes on coffee, tea and newspapers, and the charges then were: Coffee, 2*d.* per dish; green tea, 1½d., and all drams, 2d. per dram. By retail, coffee was 5*s* per lb.; chocolate, 3*s*., and tea ranged from 12*s*. for common to 28*s*. for fine. (*Ashton, Vol. 1, page 203.*)

One of the oldest books I have come across devoted to coffee and its affinities,—tea and chocolate,—is by M. de Bleguy, printed in Paris in 1687 and entitled "Le bon usage du Thé, du Café, et du Chocolat." In it he says he much preferred the coffee he obtained from Marseilles, which had come direct from Aden, to that from Rouen, which had been obtained from Dutch wholesale druggists and had been a long time on the way. I regret to say that at this early date he tells us that, having had his suspicions and after several attempts to bring the subject forward, he got into intimate conversation with several coffee merchants, and leading them to understand that he knew all about the sophistication of their commodity as practised by the trade, he was confirmed in his suspicions, and several dealers admitted to him that to the genuine article they added a third part of peas, and that for this purpose they preferred the Spanish variety, which were as yellow as the native grown, but much smaller. He says that to make powder of coffee it is much better to grind it in mills specially made than to use the pestle and mortar, and it is pleasing to note that he says

the cafetières made in England, of which he gives several interesting illustrations, are of much better material than those manufactured in Paris.

Early Appreciation of Coffee's Medical Virtues.

In 1721 there was published in London an instructive pamphlet by R. Bradley, Fellow of the Royal Society, entitled "The virtue and use of coffee, with regard to the plague and other infectious distempers, containing the most remarkable observations of the greatest men in Europe concerning it, from the first knowledge of it down to the present time, to which is prefixed an exact figure of the tree, flower and fruit taken from the life." Never before or since has there been a more enthusiastic advocate of coffee. In his preface he says:

"At the time when every nation in Europe is under the melancholy apprehension of an approaching plague or pestilence, I think it the business of every man to contribute to the utmost of his capacity such observations as may tend to the service of the public. Upon this foot I have published my thoughts of the plague in general, upon an hypothesis which many of the learned concur with, though some dissent from it. However, I find that the remedies prescribed by the physicians of both opinions are little different from each other. It is remarked by several learned men abroad that coffee is of excellent use in time of pestilence, and contributes greatly to prevent the spreading of infection and one of them in a letter to me observes that in some parts of Turkey, where the plague is almost constant, it is seldom mortal in those families which are rich enough to enjoy the free use of coffee, but that the poorer sort who want that benefit seldom escape, and therefore justly concludes that it is of great virtue and use in all distempers, which are supposed to be occasioned by insects or unwholesome air. And it is likely that, if the true virtue and use of coffee had been known in London in the year 1665, when the plague raged there, Dr. Hodges and other learned men of that time would have recommended it. But since it is now become a liquor known to more people, I have thought fit to publish its history with several additions and remarks, especially how far it is useful in pestilential cases; with an account of the best method of roasting the berries and preparing them after roasting, and for the satisfaction of the curious have prefixed a figure of the tree, flower and fruit, which I delineated from the growing tree in the Amsterdam gardens."

The gardens referred to are the botanical, and the proof of the enterprise of the Dutch, which had so great an influence in the early transplantation of coffee from its home to the whole of their suitable dominions, is very interesting.

Reverting to the book we learn that Jacob Cotovicus in his "Travels to Jerusalem," Anno 1598, mentions coffee to have been at that time a drink much in use amongst the Turks, and tells us that some of the Arabians called it *Cahua*, and others *Bunna* and *Bunchi*. He also quotes Prosper Alpinus, a Venetian physician, and Paladanus Sandys, who in his travels through the Turkish Empire met this drink at Constantinople, and says "It was sold in many public places there which he calls *coffa* houses, where the Turks sit chatting most of the day, and sip a drink called *coffa* in little China dishes as hot as they can suffer it, black as soot and tasting not much unlike it."

He also notes the investigation of John Bauhine, Casper Bauhine, Mr. Ray, Poncett and Monsieur Bernier, who affirms that at Grand Cairo, where there were above a thousand coffee houses, there were but two persons who rightly understood the art of roasting. He says: "I have taken some pains

to experience the best method of roasting it, and find none so good as by an iron vessel made to turn on a spit; and it may be roasted befor a clear fire, or over a charcoal fire, and there every berry has a fair share of heat; and I like it roasted in a middle way, not overburnt. Most persons of distinction in Holland roast their own berries."

Monsieur du Four, a merchant of Lyons, in his treatise of the liquor, recommends to us that the decoction be prepared in earthen or stone vessels as preferable to those of tin, copper, or any other metal, which, he says, take from it much of flavor and goodness: and an ingenious friend of his observes that the boiling of it evaporates too much of the fine spirits, for which reason he advises us to pour boiling water upon the powder and let it stand to infuse four or five minutes before the fire, and that this method in Bradley's judgment much exceeds the common way of preparing it. (Let me say after nearly two centuries how cordially I agree with Mr. Bradley and his authority, Monsieur du Four). Had the good advice given so long ago been more generally followed I think we should have been greater drinkers of coffee in England to-day.

Further on he takes occasion to explain wherein lies the difference between what we call Turkey and India coffee.

"The first of these is bought by the Turks merchants, who go up into the country where it grows, and there contract for the fruit of gardens, or so many trees as they have occasion for" (as our fruit-mongers do for cherries in Kent). "When it is gathered they bring it upon camels down to Juda, a port at the bottom of Red Sea, to be transported to Suez, from thence by land about 70 miles to Grand Cairo, and so down the Nile to Alexandria, where it is shipped for Asia or Europe. There commonly comes thus every year to Egypt from 60 to 70 thousand bales of coffee, which may contain one with the other about three hundred weight each. But that sort which we have under the character of India coffee is bought at Bettelfukere, where the English, Dutch and French of late years send up factors to buy the said commodity and bring it on camels to Moco, from whence it is shipped for Europe. The immense quantity of this fruit which is yearly exported from one country to other parts of the world is almost incredible, which as we are informed, is computed to be about a million of bushels one year with another, and it may seem unreasonable to believe that this country alone should produce it in so great abundance (considering how small a quantity can be gathered from each single tree) yet, with as much surprise we as may admire how it is possible even the numbers of bushels I have mentioned should be sufficient to answer the vast demand for it, since it is certain that besides the general esteem it has gained all over Europe, it is not less requested throughout Africa and Asia to otheir utmost bounds."

It is said that in England in 1683 more than 12 million barrels of beer were brewed to supply the needs of a population of 5 million people. Water was scarcely ever drunk, even by children, and the enlightened Locke, in his "Thoughts Concerning Education," published in 1693, says a child's drink "should be only small beer." Proof indeed that the times were ripe for newer and better ideals, and it is a plea sure to learn from Hatton that in 1708 there were 3,000 coffee houses in London.

In 1740 complaint is made that society at Bath is very dull. "All the morning spent in 'How d'ye do's?' all the afternoon in asking "What's trumps?' and the ladies' sole talk in the ladies' coffee house was of gout, sciatica and rheumatism,—*Simmons' Spice Mill.*

(To be continued)

SOIL.

Soil Denudation by Rainfall and Drainage and Conservation of Soil Moisture.

The following paper was written by A. HOWARD, ESQ., *Imperial Economic Botanist and distributed to the members of the meeting of the 8th Board of Agriculture held at Coimbatore in December last,*

This paper has been prepared, at the request of the President, for the consideration of the Committee of the Board of Agriculture appointed to deal with soil denudation, drainage and water conservation. No effort has been made to treat the subject exhaustively. The note is intended merely as a personal contribution to the discussion of a subject of great interest and of very wide application to Indian Agriculture.

SOIL DENUDATION.

The whole of the cultivation area of India affected by the monsoon is subject to the loss of fine soil by rain wash. These losses are accentuated by the uneven distribution of the rainfall and by the occurrence of heavy falls which often exceed six inches in a single day. The amount of this annual loss varies according to local conditions and is by no means restricted to those areas where the slope of the land is considerable. Even in tracts of the Gangetic plain like North Bihar, where the difference of level beween the high and the low lands is only a few feet, the damage done by wash is enormous and the amount is hardly realised. One of the results of this wash in Bihar has been to remove the fine soil-particles from the higher lands and to deposit them in the rice areas. In consequence, the fertility and water holding capacity of the high lands can only be kept up by the application of organic manures, while the thickness of the stratum of soil suitable for rice in the rice acres is much greater than is necessary for this crop. The extra soil washed down into the rice areas can be regarded as so much unproductive and lost capital.

At Pusa, some attention has been paid to this subject during the last eight years and methods have been devised to check the loss of fine soil by rain which used to take place every monsoon. The large fields have been divided into smaller areas so as to break up the run off into units and so dissipate its destructive energy. Each small field is sourrounded by trenches and narrow grass borders, which serve both to conduct away the run-off and also to hold up the fine soil. A process of natural terracing goes on, the fields level themselves, and the loss of soil is largely prevented. Each field deals with its own rainfall only.

In addition to the loss of soils in the Gangetic plain there are many other well known examples of denudation in India, such as that on the black soils of peninsular India and on the *karewa** lands in Kashmir. In the former case, various systems of embankments are practised to some extent, but in Kashmir nothing is done to save the fine soil of the upper terraces of the valley.

* The *karewa* lands in Kashmir are upper alluvial terraces on the side of the valley, and at a higher level then the plain through which the Jhelum now flows. These lands are much denuded by rain wash, and only carry small crops.

The prevention of soil denudation by rain wash in India seems to be a matter well worth the attention of the Agricultural Department. I am aware that work is already in progress on this subject in some localities, but there can be no question that it is not receiving that attention the subject deserves. Much is being done to find the cheapest manures for crops but less attention is being paid to the loss of fine soil which, if prevented, would render manure not so necessary in the future.

It is in the planting areas of the East, however, that the best examples of soil denudation are to be seen. In the hill tracts in the centre of Ceylon, an area which is now covered with the gardens, the original forest canopy was removed to make room for coffee which later gave place to tea. Little or no provision was made at the time to retain *in situ* the fine soil of the original forest, and in consequence the loss of soil has been enormous, and is still going on. The water retaining power and fertility of the tea soils of the hill regions of Ceylon have fallen off on account of the loss of fine particles, and large sums are spent annually in adding green and other manures to the land. The agricultural capital of the Island has been allowed to run to waste, and can never be replaced by any system of manuring. This short-sightedness is remarkable considering the local examples of terracing for rice on the sides of the valleys where the preservation of the soil has been carried to a fine art. There is no doubt that the best way in which the planting industry could have been assisted would have been by the enforcement of a regulation to immediately terrace all lands from which the forest canopy had been removed. I have heard that such a regulation is in force in Java. I am not familiar with the local conditions of the planting industries in the Federated Malay States, in Assam, and in Southern India, but I understand that in several of these tracts, such as the Malay States, Southern India, and the Darjeeling tea tract, this question of rain wash is one of the greatest importance. It is difficult of course to remedy the mistakes of the past by the measures open to Government, but it seems to be a matter for consideration whether something cannot be done in the future in India, where forest land is sold for planting purposes. The difficulty will be to frame rules with regard to terracing which, while allowing of the development of the country, will, nevertheless, check the destruction of the natural agricultural capital,—namely, the fine soil, rich in organic matter, made by the forest. The aim should be to allow the development of the country to go on, but to prevent the dissipation of its natural resources. The example of Ceylon is sufficient to indicate the damage which results in these matters from the absence of a strong guiding hand.

Drainage.

In a country like India, where most of the rainfall is frequently compressed into a period of about four months, the subject of drainge is apt to be disregarded. Where so much is heard about irrigation it is difficult to realise that some tracts of the country, Bihar, for example, suffer from too much rain, and are in need, not of elaborate systems for the distribution of canal water, but rather of some provision for getting rid of the excess precipitation. Drainage is also of importance in canal-irrigated tracts, not only in North West India, but also in such river deltas as the Godavery, where weirs have been built across the rivers so as to convert an ancient system of inundation into one of perennial irrigation.

In Bihar, drainage and soil denudation are intimately connected. The high lands are impoverished by wash, and the fields below are water-logged by the extra water which drains over them from above. The

system adopted at †Pusa of making each field deal with its own rainfall not only checks the loss of fine soil, but also serves as an efficient method of drainage. The run-off is collected from the field trenches into larger channels, which lead to the lowl-ying rice fields where such water is frequently welcome. If the year is one of flood, the extra water brought by these trenches makes no appreciable difference, as in any case the crops on the flooded areas will be lost. Further, it appears that under this system of drainage the total run-off is less than if there were no drains. By splitting up the rainfall, more of it seems to be absorbed by the upper lands than when run-off is unchecked. A similar systen of drainage to that devised at Pusa can be seen applied on a large scale in Italy, particularly in Lobardy. Great care is taken, in Italy, to keep the system of surface drains in order and also to cut off from low-lying areas the run-off from higher lands which otherwise would convert these low areas into swampy ground.

The advantages of a drainage system in the alluvium are very great. More water is absorbed by the soil, wash is largeiy checked, and the lower fields increase in fertility to a remarkable extent. If the low-lying areas in North Bihar, which now only grow poor crops of rice, could be drained they would be among the finest wheat-lands in the world. Not only are the lower fields rendered more fertile by drainage, but their cultivation can be carried out at a less cost and much more rapidly than before. The continuous wheat plot at Pusa furnishes a good example of the benefits which arise from drainage. Previously this field was often waterlogged, and only gave good crops in years of poor rainfall. After being drained the yield increased, and after five crops of wheat without manure there is no sign of any soil exhaustion. The only soil exhaustion I have experienced in Bihar is that due to the loss of available nitrogen by waterlogging, which has been shown to produce in a single wheat crop a loss of 16 bushels to the acre (Pusa Bulletin 33, pp. 3, 4).

The indigo estates in Bihar are now paying considerable attention to drainage, and already the beneficial results obtained have exceeded expectation. On one estate near Pusa, for example, a beginning was only made during the present year, when an area of about 25 acres was divided up into four fields which were also protected from the surface wash of higher land. The results were at once apparent, and the owner is convinced that a proper system of drainage is the first condition in any scheme of land improvement in Bihar. If the present rate of progress is maintained, the indigo estates will soon furnish examples of the benefits of drainage in Tirhoot, and it may then become a matter for consideration whether or not the improvement of the Division should not be taken in hand by Government, and proper studies made of the rivers and other drainage lines, This has been done in Italy with marked suecess, not only from the point of view of crop production, but also from that of the prevention of malaria.‡

† In order to carry out this system of drainage in practice a drainage map is essential. This can best be obtained by following the method originally devised by Sir Edward Buck in 1870, when Settlement Officer in the Farrukhabad District. This consists in marking on an ordinary map the directions in which rain water runs off the land; and it enables the various drainage lines to be determined far more easily and cheaply than by any system of taking levels.

‡ Sir Edward Buck,—*Report on the control and utilization of rivers and drainage for the fertilization of land and mitigation of malaria, 1907.*

The necessity of drainage in connection with schemes of canal irrigation in India is well known, but it would appear that insufficient attention is still paid to this matter. This is natural, considering the time and money entailed in vast irrigation schemes, and the desire of the promoters to finish the work quickly and to reduce the cost so that the project may yield high dividends. It is probable that, as time goes on, the Agricultural Department will be consuted in all future irrigation projects, and will be able to ensure the provision of adequate drainage arrangements.

Conservation of Moisture.

Experience at Pusa, and at Quetta, confirms the enormous importance of a proper system of conservation of soil moisture. Similar results have also been obtained in the *barani* || tracts of the Punjab and elsewhere. In the alluvium the greatest source of loss of soil moistnre, while the land is under a rabi crop, is undoubtedly the hard snrface crust which forms after the application of irrigation water. A dry surface is a necessity if the maximum crop is to be produced under *barani* conditions. Applying one irrigation to the wheat crop at Pusa does more harm than good if the surface skin, formed by the water, is not broken up throughly afterwards.

The most efficient instrument so far found for breaking up surface crusts in the alluvium, and in producing a fine dry mulch for a rabi crop, is the lever harrow. This implement is an ordinary harrow, provided with a lever by which the slope of the tines can be altered at will. By sloping the tines backwards the harrow passes over a young wheat crop without injury and at the same time breaks up any surface crusts leaving a fine dry mulch behind. It has also proved of great use in the cultivation of Java indigo in Bihar during the hot season. At Quetta its use has increased the yield of dry crop wheat from five to nineteen maunds to the acre. In Bihar these harrows have been taken up by the wheat growers and, on estates where they are in use, are regarded as indispensable.

Both Pusa and Quetta are good examples of tracts where dry farming is likely to be successful. At both these places the water level is less than 30 feet from the surface and in both cases the soil is alluvial in character. With a proper system of management of the surface soil, and the provision of a dry mulch, use can be made in crop production of the moisture which rises into the sub-soil from below. It is in such tracts that dry farming methods are most likely to succeed, and where the attempt can be made to grow large crops with little or no rainfall. It has been suggested that such methods might be applied in over-irrigated tracts like Amritsar, where the sub-soil water is only a few feet below the surface, and where, with a proper system of cultivation, good crops might be grown from the ground water supplemented by the rainfall without any irrigation at all.—*The Indian Tea Association. Scientific Department Quarterly Journal.*

It may interest some of our readers to know the spelling of the name of the famous little Welsh village in Anglesey,—near Gaerwen Junction :—It is "Llanfairpwllgwyngyllgogerychwyrndrobwllgogerbwlllantysiliogogogoch," and is usually called "Llanfair P. G."

|| The *barani* tracts of the Punjab are those in which crops are raised on the natural rainfall without any irrigation.

CORRESPONDENCE.

Labour Department.

THE EDITOR,

The Planters' Chronicle.

Sir,—Knowing that this letter cannot appear in your columns until the fate of the proposed Labour Department of the U. P. A. S. I. is decided one way or the other, I would not trouble you with it, were it not for the personal reference to myself in Mr. Mead's letter of the 26th April which was published in your issue of May 2nd. It may be too late to do any good. On the other hand the only harm it can do is to occupy too much of your space.

Mr. Mead starts with the avowed intention of making everyone thoroughly realise the scope and limitations of the proposed Deparment, but winds up by asking Mysore, Coorg and the West Coast what is the object of their paying for the troubles of others, when they can attend to their own at least equally efficiently and at a quarter the cost. This is an appeal to those districts not to join, but to take Mr. Mead's word for it that without any knowledge of the business, it can be managed with the same immediate efficiency as if it is in the hands of those who have already learnt it, and that this can be done at a cost of 8 annas an acre per annum. This in spite of the acknowledged fact that the Labour Departments already in existence cost over Rs.2 per acre per annum. The fact is that Mr. Mead's employers do not at present want to join, and he therefore does his best to serve their ends, by trying to prevent the formation of an organization which may prove inconvenient to them at some future period. I have no fault to find with such a motive.

In spite of the agreement of opinion between Mr. Mead and others, that my expression of ignorance of what "preferential treatment" meant, was "more refreshing than candid," I think those who heard me speak at Bangalore know perfectly well that what I was trying to arrive at was what S. Mysore Planters meant by it. Even now, I do not mind saying that it may mean different things to different men. The Shevaroys, for instance, may mean that no one else but Planters on those hills should be allowed to recruit a cooly within 50 miles of their district. S. Mysore may mean a priority of claim in those districts on which they have long depended, and still depend, for their labour supply. The clearest definition of the words was necessary before I could discuss them. In saying so, I was quite candid.

Mr. Mead's letter tells us that, three years ago, those who are included in his "We" did not employ a cooly from S. Canara, and this year 1,000 will be employed "in Cochin State alone." I wonder if any pains were taken to find out whether these coolies are under advance to Coffee Planters or not, or if it is a case of tampering with labour, and as honest as any other form of theft? If they happen to owe an average of Rs.10 per head to planters in Coffee districts, it may mean a loss of Rs.10,000 straight away, quite apart from shortage of labour and other questions. It will certainly be inconvenient, in such cases, to have a strong Labour Department, backed by the majority of Planters in S. India, posing about these things, and working in the interests of its subscribers. Mr. Mead again alludes to the control of the Department being far too much vested in one firm. I need not repeat what happened at Bangalore on this point. I can only hope the subject has been more clearly grasped by others than by Mr. Mead, and that the reason why one firm has a representation on the Committee of Control in a proportion of 1 to 3 is that this is necessary for the security of the proposed Labour Department of the U. P. A. S. I. "Safety first" is not a bad motto in business matters.

Knowing as we do that Tea Estates are not the chief competitors of Coffee Planters for labour in S. Canara, it is interesting to note that, while soothing the fears of those interested in Coffee so far as labour competition with Rubber Estates is concerned, Mr Mead deliberately makes statements provocative of enmity between Tea and Coffee Planters. If we had not had to deplore Mr. Mead's absence from the last U. P. A. S. I. Meeting, he would have seen that certain areas were set apart for new labour connections. If Tea Planters wanted to "go for" S. Canara coolies, this provision need not have been made. The areas to which I allude are sufficient (if not they can be extended) to relieve the pressure all round, by being drawn upon for entirely new labour. I am quite aware that some gangs from these districts have proved unsuitable for any estate work,—and there have been cases where the conditions at the time, and not the coolies, were unsuitable,—but I also know where large gangs proved eminently successful. The raid of Mr. Eckert of Madawella (Ceylon), and its success, is fresh in my memory. Not being too proud to follow a lead, I do not see the slightest necessity for recruiting S. Canara coolies for tea estates in Travancore, which Mr. Mead so confidently anticipates.

While it is true that tea will require more labour, there is no reason why it should encroach on S. Canara, nor on any other district on which coffee planters rely for their labour. That the Labour Department will precipitate matters to the detriment of Coffee Planters as far as Mr. Mead can see, merely shows that he does not see the object for which the Department is to be formed.

On the point of advertising, Mr. Mead credits a policy to the U.P.A.S.I. Labour Department, which, so far as I know, has not been formed. I ask your permission to be allowed to elaborate it a little. I have never issued an advertisement without first submitting it to my superior officers, and I take this opportunity of saying that I shall pursue the same course in future, be it with the U. P. A. S. I. or otherwise.

Whether the Department will be allowed to publish, broadcast throughout S. Canara, advertisements for any tea planter subscribing to it, is a question for the Controlling Committee to decide. Speaking for myself, I do not think this can be done. Certainly not in opposition to the wishes of those already in the field. I should certainly use my vote against it in the unlikely event of any such action being proposed, for, to my mind, to encourage future interlopers would be subversive of one of the very important objects of the Department.

I agree with Mr. Mead on some points, and one of them is that, in serving its own subscribers, the Department cannot help doing good to some non-subscribers. I go further, and say that it cannot help benefiting the whole Community. Knowing representative men from all districts, already promising definite support, I do not hesitate to say this happy result will not be a matter for dissatisfaction. But should this be made a reason for the subtle implication that Estates may therefore withhold their support ?

Mr. Mead thinks the K. D. H. P. Co's Labour Department is not necessary to the rest of S. India. Others may possibly agree with him. I need only remind your readers that the General Meeting of the U. P. A. S. I. held in 1913 gave explicit instructions to its Committee to do everything possible to get the K. D. H. P. Co. to come in. As this would not have been done if it had been thought unnecessary, there is a difference between the expressed opinion of the U. P. A. S. I., assembled in General Meeting, and that of Mr. Mead. As regards Mr. Richardson's Commission, I have only my own opinion to put against his. I hold that, without it, a link in our

chain would not only be weak, but wanting, and therefore it is necessary for the complete success of the Department working for the whole of South India, which I take to be the intention of its promoters. Mr. Mead's alternative is what he calls his old heresy,—of several rival Labour Commissions. His assurance as to the efficiency (which of course should be immediate) and cost, of these, will already have been taken at its proper worth. Personally I value Mr. Mead's opinion on other subjects very greatly, but not on this one. I hope he will not take offenee at my refreshing candour in saying so.

Yours faithfully,
AYLMER MARTIN.

Geneva, 3rd June, 1914.

22nd June, 1914.

Labour Commission.

THE EDITOR,
The Planters' Chronicle.

SIR,—As there has been much discussion in your columns the last few months about the necessity or advisability of forming a Labour Department in South India, I enclose a cutting from *The Financier*, May 26th, "Rubber Notes" by E. L. Killick, in which he discusses the Annual Report of the Planters' Association of Malaya.

It may interest some of your readers to know what is going on outside their own little nest, and may possibly impress them with the necessity of joining some scheme to protect themselves and their coolies from their more energetic brethren on the other side.

I am,
Yours faithfully,
KENNETH HARPER,

Craigmore,
Nilgiris.

EXTRACTS REFERRED TO ABOVE.

Labour Supply.

Regarding the question of sufficient labour to meet the general estate requirements, the past year is considered to have been a fairly satisfactory one, although the need of extending the existing recruiting grounds is as urgeut as ever. It is proposed to open a new immigration depôt in the northern part of the Madras Presidency, and negotiations to that end are now proceeding with the British India Steam Navigation Company. The following figures may be taken to indicate how the attractions afforded by Malaya have stimulated coolie immigration from Southern India :—

		Arrivals.	Departures.	Net gains.
1912	...	106,928	63,885	43,043.
1913	...	118,583	70,090	48,493.

What the planting industry means in the way of material prosperity to the Indian coolie may be gathered from the statement that the remittances by money order to India through the various postal departments in the Federated Malay States amounted last year to Rs.49,36,939, against Rs. 42,95,646 in 1912. More important still is the wonderful improvement which has taken place in the health of estate labourers within recent years. The maintenance of an adequate labour supply obviously depends to a large extent upon health conditions. It is therefore gratifying to note how the death rate among plantation coolies has been reduced. In 1911 the death rate among estate labourers was 63 per mille; in 1912 the rate fell to 41, and last year it was down to 29 per mille. These figures, it is believed, compare more than favourably with any health statistics of a tropical country.

Sidapur,
Coorg.

Labour Commission.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Sir,—As one of the Delegates of the Coorg Planters' Association who attended the meeting held in Bangalore last March, in connection with the proposed Labour Department, I think it is up to me to give a few facts in reply to Mr. Mead's letter in the *Chronicle* dated 2nd May. I have been waiting to reply until I could get actual figures, before making any statements. Mysore and Coorg, it is true, have stood together through the early days of the Labour Department, and I think I may say we are proud of our Ally. We went to the Delegates' meeting prepared to support each other, and brought forward our views about preferential Recruiting Areas; we heard what Mr. Aylmer Martin (an expert on labour recruiting, and labour generally) had to say in reply, and recognised that our demands were somewhat difficult for the labour department to agree to, or to carry through; but at the same time Mr. Martin pointed out that "labour for certain districts would naturally be drawn from certain recruiting areas, that these areas would be kept to, as much as possible, but that it was not in the power of any labour department, to stop a member advancing labour in any other recruiting area. The Mysore and Coorg Delegates seeing that, if they insisted on the hard and fast rule about preferential recruiting areas, it probably meant wrecking the proposed Labour Department, gave way to Mr. Martin's superior judgment.

At the meeting there were present some two dozen delegates, chosen from different Associations; we thrashed out the *pros* and *cons* for two days, and in the end were unanimous in trying to carry through the Labour Department.

"The touching solicitude" (referred to by Mr. Barber and Mr. Richardson) for the welfare of Coorg and Mysore, shown by Mr. Mead, is quite a surprise for us in Coorg; we are not used to such "disinterested" treatment, and are accustomed to choose our own line for ourselves. To show that Mr. Mead's sudden solicitude for our welfare is not appreciated so much as others might be allowed to expect:—More acres have already joined the Labour Department than are represented on the "Coorg Planters' Association." I have this fact from the Secretary of the C. P. A. himself, and only mention it to show our Mysore brother planters that Mr. Mead's anxiety for our welfare is not keeping Coorg Planters from joining the Labour Department.

It is a pity that Mr. Mead did not attend the meeting held in Bangalore, and state his views, instead of waiting until the scheme is nearly assured, and then trying to sow dissatisfaction in the different camps. We know Mr. Martin and Mr. Richardson are well informed on all labour troubles, and does Mr. Mead seriously think that Mysore and Coorg are prepared to throw up the scheme that has been thoroughly thrashed out by a very competent executive, and afterwards again by 24 Delegates, to follow and join him (Mr. Mead) informing a labour commission, with no particulars given, no estimates made, except that it is *not* to cost more than 8 annas per acre?

No, let the Labour Department stand or fall on its merits, and have honest criticism by all means. So much good advice hae been given in the

Chronicle, quoting " Union is strength," the fable of the bundle of sticks &c., but still an old chestnut applies better,—the sailors prayer before fighting with the bear,—" that if help was not to be given him, dont help the bear ! "

Yours faithfully
H. M. MANN.

Sidapur, 21st, June 1914.

Since writing the above letter, I hear semi-officially that the Labour Department will go through on its present promised acreage.

14-4-1914.

Staining Ceiling Boards.

THE EDITOR,

Planters' Chronicle.

Dear Sir.—Could you or any of your numerous readers of the *P. C.* let me know the cheapest and best preparation for staining ceiling boards ?

Yours faithfuily
PIRATE.

Fertilisers.

THE EDITOR,

Planters' Chronicle.

Dear Sir,—As I am not an expert in fertilisers, may I trouble Mr. Birnie kindly to give me information on the following points :—

1. Will he kindly name any one or two fertilisers *not* Nitrates ?
2. Why does he say that the Nitrogen *alone* in saltpetre should be considered ? What about the 30% or so of Potash it contains ? Is this of no value ?
3. Is the Potash in Sulphate of Potash as soluble as the Potash in Saltpetre ?

I think many of your readars would be glad of enlightenment on these points.

Yours faithfully,
NEMO.

Purchasing Potash Manures in England.

Hallery,
Mercara P. & T. O.,
N. Coorg,
June 19, 1914.

THE EDITOR,

Planters' Chronicle.

Dear Sir,—After my letter *re* purchasing Potash Manures in England, I think it is only fair to Mr. Birnie and the Agents of the Kali Syndikat to say that one of the Agents has now offered me quotations for Sulphate of Potash which I believe to be more favourable than any I can procure from Home.

Yours faithfully,
J. A. GRAHAM.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents

The Labour Department is started from July 1st, and it has been thought advisable to keep the Barometer on the front page, untill the requisite number of 100,000 acres is gained. On this day the Barometer reads 94,450·41 acres.

We publish the proceedings of the North Mysore Planters' Association.

We continue to publish the article on the Commercial Aspect of Coffee, which maintains its interest for coffee planters, and in a small space gives them the history of their industry. What has been written makes one almost regret the abolition of the Coffee House.

From the Hawaiian Agricultural Experiment Station Annual Report we cull an article on Soil—its Nitrification and Ammonification. We look forward to the results of their study of humus with reference to its nitrogen.

Our Correspondence columns contain a long letter from one signing his name as "Unity is Strength," written from London in May last; he has not of course seen the late upward rise of the Barometer.

We trust that "Pirate" will find the information he wants in those replies to his query.

We have to apologise to "Nemo" for the mistake that occurred in his letter. The blame lies with our own typist.

We trust that "Kithogue" is taking too pessimistic a view of the Green Scale, and will not throw up the sponge or rather sprayer. Enquiries are being made for some natural enemy of the scale by Dr. Coleman and Mr. Bainbrigge Fletcher, which we trust will be successful. In the interval everything depends on the planter himself.

We regret to say that up to the moment of writing not so many Exhibits have come in as came last year.

The *Chronicle* next week will mostly be taken up with the opening proceedings of the Annual Meeting.

Many Delegates have already arrived. Amongst them the Chairman, Mr. Mahon, and Mr. J. G. Hamilton, who is going to Messrs. Volkart's Manager of their Curing Works.

BAROMETER

OF

Labour Department.

	100,000
4-7-14	94,450·41
27-6-14	90,219·41
20-6-14	89,619·41
13-6-14	88,574·41
6-6-14	86,429·41
30-5-14	84,867·41
23-5-14	82,851·41
2-5-14	82,293·90
25-4-14	79.820
18-4-14	77,958
11-4-14	74,607
4-4-14	73,057
28-3-14	68,757
21-3-14	68,611

"That as it is decided that the Labour Department shall be started on 1st July, it shall be considered that the scheme shall not have succeeded if sufficient support is not forthcoming by that date."

DISTRICT PLANTERS' ASSOCIATIONS.

North Mysore Planters' Association.

Proceedings of the Quarterly General Meeting held at Balehonnur, on the 14th June, 1914.

PRESENT.—Messrs. C. H. Browne, C. P. Reed, F. W. Hight, R. G. Foster, H. G. Bonner, W. H. Reed, (Honorary Secretary) and G. N. Frattini. *Visitor*: Mr. C. Browne. *By proxy*: Mr. S. L. Mathias.

Mr. T. Hunt having resigned Mr. H. G. Bonner was elected President.

Retention of Services of Scientific Officer.—After some discussion it was decided that this meeting is in favour of the Madras Government taking over the Scientific Department of the U. P. A. S. I.

Black Rot Experiments.—Mr. Frattini explained the experiments he was making and asked members to help him by trying them on their own estates. Mr. Browne then undertook to commence the experiments on one of his places.

Co-operation Purchase of Manure.—Mr. Frattini addressed the meeting on this subject, and after discussion it was agreed to appoint a Committee to go into the question. Messrs. Bonner, Danvers and Lund were elected to serve on the Committee.

Election of Delegates to U. P. A. S. I. Meeting.—Messrs. C. Danvers and W. H. Reed were elected to attend the Annual General Meeting on the 6th July.

U. P. A. S. I. Meeting.—The various subjects on the agenda which were of interest to the Association were discussed and instructions given to the Delegates.

(Signed) W. H. REED,
Honorary Secretary.

The following statement gives the exports of tea from South India during the last two seasons:—In the Report of the Seaborne Traffic of the Madras Presidency for the year 1913-14, the following details are given of the exports of tea during 1912-13 and 1913-14:—

	1912-13.		1913-14.	
	lbs.	Rs.	lbs.	Rs.
United Kingdom ...	9,661,155	71,39,678	11,925,654	86,71,508
Canada ...	5,589,622	34,93,513	5,287,719	33,04,886
Ceylon ...	4,202,937	26,90,815	3,871,232	24,23,147
Other countries ...	440,820	2,76,745	344,441	2,16,808
Total ...	19,897,534	1,36,00,751	21,429,046	1,46,16,349
Average price per lb, according to shipping bills ...	10 annas, 11 pies.		10 annas, 11 pies.	

—*Indian Planters' Gazette and Sporting News.*

COFFEE.

The Commercial Aspect of Coffee.

(*Continued*)

The Great Number of London Coffee Houses

In 1788, when the big signs of the old London taverns were taken down to admit free circulation of air through the dingy and murky city, the old-fashioned inns greatly decreased and the coffee houses again multiplied in numbers, partly due to the College of Physicians "recommending coffee as a wholesome beverage," so much so that in the beginning of the 19th century they exceeded 9,000 in London and suburbs alone. (*Harpers Magazine*, March 1882.)

De Archenoly, in his "Pictures of England," speaking of the year 1797 says there existed several hundred coffee houses in the neighbourhood of the Royal Exchange alone, and that in them more business was transacted than in the Exchange itself. To show how the commercial coffee houses were linked up with the Exchange itself, I have with me an actual cutting from the *London Gazette* of Oct. 19, 1749, which is only illustrative of many other similar contemporary announcements :

"For sale by the candle at Lloyd's coffee House in Lombard St. on Wednesday the 1st of November twelve o'clock noon.

The good ship *Warwick* etc, etc., etc. Inventories to be seen on board, at the place of sale and of Samuel Brooks broker.

To be *spoke* with daily at eleven o'clock at Cole's Coffee House in Birchin Lane; and after at Lloyd's Coffee House in Lombard Street, or on the Exchange."

By the growth and development of the seeds within them, the western or political and literary coffee houses paved the way for and gave place to the clubs which succeeded them, and their exclusiveness suggested the provision of such institutions as would automatically keep out intruders, and the unsought company of uncongenial spirits.

In mercantile circles the specialization of commerce and its segregation into more clearly defined quarters, such as the Baltic, the Wool, Coal and Corn Exchange, and the provisions of the world-famous commercial sale room of Mincing Lane, the foundation stone of which was laid on January 1, 1811, and rebuilt in 1818 together with the wonderful development of commercial journalism, made the city coffee house less and less a necessity While to these depressing factors the increasing rental charges contributed to make the business unprofitable and hastened its extinction. For the modern Workman's coffee house movement of 1875, admirable in intent and enthusiastic in the philanthrophy of its founders, cannot claim to be even in the direct line of succession to the coffee houses I have tried to describe, while I fear that their dispensation of a dark brown fluid which "neither cheers nor inebriates, but distends," has done much to alienate the sympathy of the working classes altogether from coffee, even from coffee as it should and might be.

In quite another category and in greater appreciation, must be mentioned the spontaneous growth of a decade or so later, which has provided in all large and many small towns cafes were coffee is made the leading feature in establishments providing light refreshments at popular prices.

In the majority of cases the coffee is of excellent quality and is constantly fresh roasted on the premises. Even this important factor, however, seems to have had little or no effect on the use of coffee in the homes of this kingdom, where the consumption per capita has fallen to the low level of 65 lbs. per annum.

The Great East India Co.

The student of the history of commerce in coffee will do well to investigate the annals of our own East India Co., and the various chartered societies for trade to the East formed under protection of various Continental powers. Justice demands that we should give pride of place as pioneer, and especially in the importance of its handling of coffee to the Dutch East India Co. Founded in 1602, before there was any European dealing either in tea or coffee, it secured from the Dutch Government the monopoly of trade from the Cape of Good Hope to the Straits of Magellan. It soon established for itself footholds at various places in South Africa and Asia, but the mainstay of its wealth and power was in the Malay Archipelago, and especially the Island of Java. In 1667 its little fleet of one small vessel and six large ships, each of which carried a crew of about 100 sailors and 25 marines, brought a cargo booked at nearly two million gulden, including large quantities of pepper, nutmegs, mace, cinnamon and silk, but no mention is made either of coffee or tea. In 1699, however, Henricus Zwarrdecroom imported some cuttings into Java from Malabar, and in 1706 the first small consignment from the island was sent to Amsterdam and enthusiastically received. By 1739, when the Dutch had had time to develop their own plantations, we find their fleet making an inventory of its cargo in the order of value as tea, coffee, pepper, sugar, mace, nutmegs, camphor, indigo, cloves, etc.

For the first 100 years of its existence the supremacy of the Dutch East India Co. was undoubted, but the commencement of the 18th century saw the rise, and the middle of it, the triumph of England and the British East India Co. It lived for nearly 200 years however, and in its time did great things. It distributed dividends at rates ranging from 12½ to 20, 40 and even 50 per cent., the average being, from 1602 to 1796, over 18 per cent. When the crash came in 1798 it left the Government to take its property and pay its debts of over £10.000,000. (See J. E. Thorold Rogers' story of Holland, and Olive Days. The Dutch in Java, also Java by A. Cabaton, 1912.)

Peace to its memory. Its methods were not such as would obtain the approval of the antislavery society or of philanthropists in general, but we have to remember that its exactions were less onerous than the devastation carried by Muhammadan plunderers, and by internecine strife. At any rate, English methods of contemporary times demand the acknowledgment that it is not for us to throw stones at our neighbours.

Our own East India Co. was first formed in 1600 with a capital of £72,000 and made its first voyage in 1601. Its monopoly was annulled by Cromwell, but restored by Charles II. Naturally the competition between them and the Dutch engendered many quarrels, culminating in the massacre of Amboyna when a number of English traders were tortured and killed. Probably expediency rather than conciliation led to the adoption of "spheres of influence," and for a long time we focussed our attention on India and Ceylon, leaving the islands of Java, Borneo and the Malay Archipelago to the Dutch. Reconstructed in 1698 with a capital of £2,000,000, it held unchecked power till the Regulating Act of 1773 required the approval of the Crown to the Company's appointment of Governor-General.

In its Herculean attempt to build up a monopoly in commerce it had acquired an empire almost as a by-product rather than of deliberate design. In 1784 Pitt had created a board of control which placed political and military control in the hands of the Government. Finally, after the disastrous mutiny of 1857, the entire administration passed into the hands of the Crown. Thus ended our own East India Co., but it, too, had played its part in the history of coffee culture and coffee trade, and I shall show later how the customs records witness, perhaps more plainly than any other available evidence, the fostering care of the Government for our East India Co., and particularly for the produce of British plantations. Its career was without a parallel in the commercial or political history of our empire, and though the last scenes of its history had been tarnished, it had paved the way for England to rise in.

The great activities of the chartered companies in the East tended, of course, to quicken enterprise in the West, and Spanish and Portuguese competed with English and Dutch and carried the profitable culture to the West Indies, to Mexico and Central America and above all, to Brazil. Here it is said to have been introduced by Palheto in 1723. Soil and climate combined to facilitate the spread of the plantations, and in the States of Rio de Janeiro, Minas and Sao Paulo coffee has been the greatest source of livelihood for the workers and wealth to the estate owners.—*Simmons' Spice Mill.*

(*To be continued*)

Need of Phosphates in Indian Soils.

It has been authoritatively put forward that phosphatic manures are of very great importance, as although the available phosphates in Indian soils are probably not deficient; and although there is no immediate possibility of Indian soils getting barren for want of phosphates, yet the total amount of phosphates in Indian soils is relatively so small and the denudition of phosphates by the export of bones, grains and oil-seeds is so persistent, that the question of supplying phosphates to soils by way of fertilisers must sooner or later assume the most serious importance. The effect of using bones in large pieces is exceedingly slow, but they should be applied in this state only when fruit trees are planted. The Nepalese are said to have a custom of putting large quantities of bones in the pits in which they plant their fruit trees and they say it makes the fruit sweeter for all time.—*Indian Planters' Gazette.*

Russia.

Proposed measures respecting packing of Russian or Foreign Fertilisers.—The Board of Trade are informed by H. M. Commercial Attaché for Russia that a "Bill to prevent the adulteration of fertilisers," which was introduced into the Duma in 1912, has recently been passed by that Chamber. The Bill provides, *inter alia*, that fertilisers of Russian or Foreign manufacture, whether separate from or mixed with other fertilising or non-fertiiising substances, must be sold only in whole sacks, casks, barrels, boxes or other kinds of packing which are undamaged and carefully sealed (lead-sealed). Each parcel must be provided with an exact indication of (1) the works, depôt, or person guaranteeing the genuine quality of the fertiliser; (2) the name of the fertiliser; (3) its weight; and (4) the percentage of useful elements and admixtures (combinations) contained in it.—*The Board of Trade Journal.*

SOIL.

Nitrification and Ammonification.

The great importance now attached to the biological processes going on in soils, particularly such processes as have to do with the rendering available of soil nitrogen, suggested the desirability of investigations on nitrification and ammonification. It is now well known that, while these processes are due to organisms, various chemical and physical factors exert great influence on the intensity of the changes brought about by them. The soils of Hawaii, as previously pointed out, are extremely abnormal in many respects; generally they contain unusally high percentages of iron oxide and alumina, and not infrequently abnormal quantities of magnesia. The physical make-up of these soils is also peculiar. The clay, which is present in very high percentages, is composed of substances differing in composition from normal clay. Climatic factors are also extremely variable, and sometimes very abnormal.

From preliminary studies it was found that the average soil contains a very low percentage of nitrate and rather large amounts of ammonia. In this work considerable attention has been given to partial sterilization as affecting these processes, and some interesting results have been obtained. The full details of this investigation have been brought together in a separate publication.

Effects of Heat on Soils.

The remarkable effects on ammonification observed to follow partial sterilization by means of heat suggested a study of the effect of various temperatures on the solubility of the soil constituents. Remarkable changes were observed to take place as a result of heating practically all the soil constituents being greatly increased in solubility. This phase of the investigation has already been reported upon in a separate bulletin and therefore need not be discussed being extremely complicated. In addition the data show that burning very greatly affects the solubility of soils.

Fixation of Fertilizers.

The comparatively large amounts of fertilizers used in the islands, sometimes in districts of extremely heavy rainfall, suggested the desirability of securing definite data with reference to the leaching of fertilizers from the soils. The subject of fixation of fertilizers has been studied extensively in most parts of the world, but only to a limited extent on soils similar to those of Hawaii. This work is being carried out by Mr. McGeorge, Assistant Chemist, and is now well under way. The data already secured show that the fixing power of Hawaiian soils is remarkably high, especially for phosphoric acid. The maximum fixing power for phosphoric acid of the soils studied has not yet been determined. In some instances as much as 0·8 gram of $P_2 O_5$ has been fixed by 100 grams of the soil without its showing any diminution in fixing power. The fixation of potash and of nitrogen in the form of ammonia has also been found to be high, but seems to reach a maximum within a comparatively short time. A point of special interest in this connection has to do with the fixation of nitrate. For many years, enormous quantities of nitrate of soda have been applied throughout the islands, sometimes in districts where the precipitation may average as much as 300 inches per annum. The data already obtained show conclusively that nitrate of soda is not retained by these soils, the leachings showing that in a very short time the nitrate passed through the soil. This naturally raises the question concerning the real explanation of

the fact that nitrate of soda frequently produces enormous increase in the yields of cane, although applied in a single application at an early period in the growth of the crop. This work is being continued with a view of obtaining data on the effect of heat on the fixing power, the effects of sterilization, etc.

Soil Organic Nitrogen.

In 1911 some preliminary studies were reported from this station on the organic matter of Hawaiian soils. This subject has again been taken up, mainly, however, with reference to the nitrogenous constituents. When it is recalled that practically all the nitrogen of soils exists in organic combinations, and that these are subject to various changes, induced by biological agents which seem necessary before the nitrogen becomes available for plant growth, it is at once apparent that any additional information that can be obtained regarding the changes in the chemical combinations taking place in soil nitrogen can but lead to a better understanding of the biological processes going on and may prove of great practical value. The wide range of climatic conditions in Hawaii, particularly with reference to the rainfal', affords ample opportunity for a study of extreme variations as brought about by moisture content of Hawaiian soils. Considerable areas of the island are maintained in a practically continuously submerged condition, whereas arid areas are not uncommon. It was suggested, therefore, that a study of the hydrolytic products obtainable from soils coming from these two widely differing sets of conditions might give some indication as to the fundamental nature of the anaerobic and aerobic hydrolyses.

The question of the composition of so-called humus, with particular reference to its nitrogen and the humification process, have been subjects of much speculation, and apart from a few special investigations little indeed is really known about them. It is true most agriculturists consider that organic matter must undergo a process termed humification before it becomes of the greatest value to soils, but just what is implied by humification is far from being definite and is little understood. A study of humus with reference to its nitrogen, to gain some insight into the nature of the cleavages that take place during the humification process, etc., has been begun, and the results will be presented in a separate publication in the near future.—*Annual Report of the Hawaii Agricultural Experiment Station for 1913.*

Portugal (Angola)

Proposed Alteration of Export Duties on Coffee.—The Portuguese "Diario do Governo" for the 7th April contains the text of a Bill, which has been submitted to the Chamber of Deputies by the Minister for the Colonies, proposing that from the first August next the export duties established in 1892 for coffee exported from the Province of Angola (*viz.*, 15 per cent. *ad valorem* for coffee exported to foreign ports, and 3 per cent., *ad valorem* for coffee exported to Portuguese ports) shall be applied only to cleaned coffee, (*i.e.*, coffee in the bean freed from all impurities—unhusked coffee, coffee husks, grit or any other foreign substances being regarded as impurities). Coffee containing any impurities is to be subject, on exportation from the Province, to a supplementary export tax of 20 per cent. *ad valorem* in addition to the ordinary duty.—*The Board of Trade Journal.*

CORRESPONDENCE.

Labour Commission.

THE EDITOR,

The Planters' Chronicle.

Bangalore.

Sir,—In your editorial notes of the issue of the 2nd instant you ask for a reply "from a large employer of labour, who has joined the Labour Department from reasons equally convincing as those given by Mr. Mead for abstaining at present." If I could not give you more convincing reasons for supporting the Labour Department than Mr. Mead has given for his abstention I should not trouble you with this communication.

Mr. Mead agrees that the Department will improve the discipline amongst coolies and maistries, that it will enable South Indian estates to compete with foreign competitors on more even terms, and that it will place a distinct check upon fraudulent maistries and coolies thereby reducing the present risks of bad debts.

What are Mr. Mead's objections to the Scheme that have influenced his decision to such an extent as to overrule the enormous advantages, which he admits that the Department will probably confer upon South Indian estates? They are stated by him to be as follows:—(1) That the cost is excessive for the work that the Department will do. (2) That the control of the Department is too much vested in the hands of one Firm, and (3) That it will actually precipitate a labour crisis in the coffee districts.

I will deal with these three points separately:—

As regards the cost, which is Mr. Mead's main objection, though he admits that it will not effect the dividends and that it will be a very small addition to the capital cost of the property of which he has charge, it appears that he objects to this because he considers that his district is so favourably situated for labour that it will not get as much value for its subscriptions to the Department as will districts such as Nilgiris, Wynaad, and the Anamalais.

"The strength of the chain is restricted to that of its weakest link." Cannot Mr. Mead see that it is the ill-favoured districts, which "set the pace" in competitive wages, advances and so on? He cannot think that his district is such a planting paradise that there will never be any outside calls upon its labour supply. The better the supply of labour in his district, the greater will be the need for protection from outside competition and all its evils.

Your article on the reports of the Collectors of the Nilgiris and Malabar upon the working of the Madras Planters Labour Act deals directly with the point in stating that Mr. Innes agrees that the difficulty in getting labour is caused not only by the unregulated internal competition but also by the very strenuous competition from Ceylon and the Malay States. Mr. Innes is of opinion that the Labour Department will be helpful in lessening the difficulties of the labour supply for the planting districts. Here is an outsider's opinion from one who has an inside and official knowledge of the situation, and it should be given the most careful consideration by those who have not yet agreed to subscribe.

Mr. Mead's solution of the difficulty in respect of unregulated internal competition is apparently to have one Commission for the Travancores, another for Mysore, Coorg, Malabar excluding Wynaad, and Cochin, and yet another for the (in his opinion) benighted districts of Wynaad, the Nilgiris and the Anamalais. Presumably he excludes Wynaad from his own group, in which it should be included from a geographical and official standpoint, because he fears that it might raise the average cost per acre in his select little family group! However, letting that point pass, how does he propose to regulate competition between these three Commissions? I maintain that the internal competition under such conditions would be all the keener because it would be under three organized departments with no restraining influence. Mr, Mead cannot think that the U. P. A. S. I. could or would bring any authority to bear upon three separte departments of this nature. If it attempted this without constituted authority to do so, it would bring about its own ruin. Seeing that the U. P. A. S. I., the official body representing the interests of the South Indian planters, would thus have no *locus standi* in labour matters, what organization does Mr. Mead suggest should approach the Government in respect of external competition? It is a point upon which, for Imperial reasons, the Madras Government will be very chary of taking action even if approached by the U. P. A. S. I. It would have good reason to refuse even an inquiry if approached on the subject by any lesser body.

I now come to Mr. Mead's next objection to the effect that the control of the department is too much vested in the hands of one Firm. I admit that Messrs. Finlay & Co., whom I look upon as public benefactors to the small proprietor, have got a considerable 'say' in the working of the Department. Can Mr. Mead give any reason why they should not safeguard themselves in the way that they have done? It is they who have made a start possible for, without the strong lead, which they gave, the matter would still be only under discussion. In my opinion it is because Messrs. Finlay, with whom I am in no way connected, have secured immunity for the industry at large from jealous bickerings amongst the representatives of large areas at Council Meetings of the Department that their lead has been followed with such implicit confidence by the small company or private proprietor, whose interests would otherwise have stood an excellent chance of being totally ignored in the malestrom of petty jealousies of his more powerful rivals with direct representation on the Council.

I admit that there might have been a risk in putting so much control into the hands of Messrs. Finlay and Co., if they had not proved by actual results that their methods were sound and their staff efficient. Few of us have any knowledge of their methods, but it is good enough for me that the only other Commission, so far as I know which is doing satisfactory work (Mr. Richardson's) has agreed to throw in its lot with the new Department. Can Mr. Mead tell us what reason he attributes to Mr. Richardson for doing so, if there was any fear of the control, vested in Messrs. Finlay and Co., being excessive?

Mr. Mead's last objection to the Department is that he considers that it will actually precipitate a labour crisis in the coffee districts. I am absolutely at a loss to understand what he means by this. If a crisis, of which I have not heard, is imminent in the coffee districts, how on earth can the Department precipitate it?

In a paragraph of Mr. Mead's letter, to which I have already referred, he appears to hold out a bait in the shape of an annual subscription of only

8 annas per acre to Mysore and Coorg if they will secede from the U. P. A. S. I. Department and throw in their lot with his proposed West Coast Group. Surely, if a crisis is so imminent in Mysore and Coorg, they would be well advised not to abandon the substance of the official Department for the shadow of Mr. Mead's group in view of the conflicting arguments, which he uses in respect of their districts? If these districts are threatened with an immediate crisis, it is absurd to suppose that an annual subscription of 8 annas per acre is going to pull them through, more especially as they will not have the official support of the U. P. A.

This apparent attempt on Mr. Mead's part to alienate the allegiance of Mysore and Coorg, whose loyal support of the Association, in spite of the latter's inability to immediately meet the demands of these two districts in respect of extradition and a reduced assessment for coffee, has been one of the determining factors in the now assured establishment of the new Department, his implied, and I consider unwarranted, insinuation that parts of Travancore are supporting the Department largely with a view to obtaining a footing in the labour districts of South Canara, and last but not least, his strictures upon those, who presume to think a start possible, even supposing that the Department has not secured guarantees from 100,000 acres by July 1st, all these points lead me to think that his letter was written, not in fair comment, but with a view to bring about the downfall of a powerful central organization, which will eventually earn the gratitude of every planter in South India, and which is the only form of Department, which can hold out any hope of salvation to the small proprietor.

Mr. Mead in the opening paragraph of his letter stated that it was written at Mr. Barber's request. In view of the enormous amount of trouble that Mr. Barber has taken in this matter, I can hardly believe that he was aware of the contents of Mr. Mead's letter before it was published, or he would never have allowed his name to have been connected with it.

Mr. Mead is wise enough to say that, immediately a start is decided upon, a number of wavering estates will be bound to join so that the area by the end of the year is likely to be as much in excess as it is now short, of 100,000 acres. The greater the support accorded to the Department the less is the chance of Mr. Mead being able to form a small Agency for the Districts which he has mentioned. This may be the reason why, if he does not intend to subscribe, he should take so much trouble to point out to subscribers the risks he fears in the formation of the Department. He appears to assume that guarantees of subscriptions have been given so unwillingly that any loophole will be taken advantage of for evading them, such as a shortage of a small area in the total guaranteed by July 1st. Surely, if Messrs. Finlay & Co are willing to make a start with less than 100,000 acres, those, who have guaranteed support, will be grateful to them for this further concession?

Another warning on the part of Mr. Mead, for which no reason is given unless he is going to subscribe, is that the matter has not been fully discussed. He must be a glutton for debate if he is not already surfeited with all that has been said and written on this subject. If, however, he is so solicitous for the safeguarding of the interests of others, why do I not I see his name amongst those who were present at the U. P. A. meetings in August and March last, more especially as his district did not even take the trouble to send a representative to the latter meeting?

Must I come to the conclusion that he is the representative of one of those companies, which consider themselves sufficiently powerful to cope with any labour crisis, 'off their own bats' when it arises, and consequently hold themselves aloof on the score of expense, though they are the best able to meet it, from a Scheme which is formulated for the benefit of the Industry as a whole?

If I have attributed wrong motives to Mr. Mead, I hope that he will accept my apologies. I have replied as fairly as I could in view of the attitude which he appears to have adopted.

For business reasons I am precluded from disclosing my identity, so sign myself by what should be the motto of the new Department.

"UNITY IS STRENGTH."

London E. C.
May, 28th, 1914.

Staining Ceiling Boards.

Handi, Mudigere P. O.,
Kadur District.
29—6—14.

THE EDITOR,
Planters' Chronicle.

Dear Sir,—I think "Pirate" could not do better than stain his ceiling boards with "Carbolinium." Apart from the dark oak colour it gives to timber, it is the best preservative I know.

My bungalow was ceiled with common Norwegian Pine 6 years ago and the coating of "Carbolinium" I gave it has preserved it from attack by white ants, although the little pests have eaten the "reepers" pretty badly, which were not so coated.

Yours faithfully,
H. GODWIN BOWER.

Staining Ceiling Boards.

THE EDITOR,
Planters' Chronicle.
Bangalore.

Dear Sir,—In reply to "Pirate" in your issue of June 27th, the cheapest and probably the best method of staining ceiling wood, is to apply a solution of Permanganate of Potash. A beautiful polish can be produced afterwards by the application of bees wax. The beautiful dark polished (oak!) floors in some London houses are nothing more than ordinary wood treated as above. Ours was one of the fakes.

The finished article turns out much darker than one would suppose when applying the solution, so a thorough test should be made beforehand to ensure the correct shade. The solution will not take on teak.

Yours faithfully,
CONDY.

Staining Ceiling Boards.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—A cheap and efficient stain for boards can be made by dissolving Potassium Permanganate in hot water. Sufficient of the crystals should be added to make the solution a *very* dark violet in colour.

For application an ordinary clean paint brush may be used or a piece of cloth. The boards should be well wetted with the solution and left to dry, the ultimate colour being a dark brown which is permanent.

Yours faithfully,

"MANGANIC."

Fertilisers.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—My Type Writer (or is it your P. D.?) made rather a pretty mess of my letter in your last issue.

The first point on which I sought information should read thus:

1. Will he kindly name any one or two fertilisers *not* Nitrates which nevertheless are as quickly available as Nitrates?

Yours faithfully,

NEMO.

July 1st, 1914.

Green Bug.

THE EDITOR,

The Planters' Chronicle.

Sir,—Surely some further effort should be made to combat this pest by the introduction of lady birds or any other natural enemy it has. Years ago Mr. Newport made an attempt to import lady birds and failed, but since then science has progressed and, may be, an expert might succeed where he failed.

Coorg are holding the appointment of their Scientific Officer in abeyance, but it would be worth their while to engage an expert to tackle the scale.

If a natural enemy cannot be found to control the scale, the coffee of Mysore and Coorg is probably doomed, for where this pest has taken hold, it has taken charge, and eventually ruined the coffee.

Our efforts with sprayers, etc., may delay for a while the invasion, but they are futile where large areas are concerned, and what happened in the Nilgiris will be obtained elsewhere.

Yours faithfully,

KITHOGUE.

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed on a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry* should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,

The United Planters' Association of Southern India,

BANGALORE

to ensure the being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Twenty-first Annual Meeting.

The Twenty-first Annual Meeting opened at Bangalore on the 6th July, 1914, at 11 a.m., at the Mayo Hall, the following being present:—

CHAIRMAN ... ... MR E. L. MAHON.
PLANTING MEMBER ... ... THE HON'BLE MR. E. F. BARBER.
SECRETARY ... ... MR. FLETCHER NORTON.

Delegates.

Anamalais	... ...	MR. C. R. T. CONGREVE MR. E. W. SIMCOCK.
Bababudan	... ...	MR. A. B. BOYD. MR S. H. DENNIS
Central Travancore	...	MR. J. A. RICHARDSON.
Coorg	... ...	MR. J. A. GRAHAM. MR. P. G. TIPPING.
Kanan Devan	... ...	MR H. L. FINCHES
Mundakayam	... ...	MR. F. E. EYLE.
Nilgiris	... ...	MR J. S. NICOLLS. MR C. H. BROCK.
North Mysore	... ...	MR C. DANVERS. MR W. H. REED.
Shevaroys	... ...	MR C. DICKINS.
South Mysore	... ...	MR. J. G. H. CRAWFORD. MR. C. LAKE.
South Travancore	... ..	MR. J. B. COOK.
West Coast	... ...	MR. H. WADDINGTON.
Wynaad	... ...	MR. C. E. ABBOTT.

Messrs. J. A. Richardson, J. G. Hamilton, C. H. Brock and C. E. Abbott voted as Ex-Chairmen

Visitors.

Sir Hugh Daly, K. C. I. E., C. S. I.
Mr. D. T. Chadwick I. C.S.
Mr. P. W. Warburton, I. C. S.
Mr. A. F. Cox I.C.S.
Dr. Leslie Coleman.
Mr. Shirly Tremearne.
Mr. Mackenzie.
Mr. Maclean.
Mr. Scoble-Nicholson.
Mr. Bernard.
Mr. Birnie.
Mr. Pascoe.
Mr. Robb.
Mr. Woosnam.
Mr Kerr.
Mr. Denne.
Mr. Bayley.
Mr. Petrie Hay.
Mr. Sladden.
Mr. Fawcitt.
Mr Payne.
Mr Tacahella.

Mrs. Mahon
Mrs Hamilton.
Mrs. Scoble-Nicholson.
Mrs. Chadwick.
Mrs Pascoe.
Mrs. Loyd.
Mrs. Robb
Mrs. Richardson.
Mrs. Pinches.
Mrs. Dickens
Mrs. Rahm
Mrs. Crawford.
Mrs. Lake.

Miss Pawton.
Miss Frier.
Miss Sladden.

AGENDA PAPER.

Monday, 6th July, Afternoon.

1. Secretary's Annual Report and Statement of Accounts
2. Chairman's Address
3. Work of the Planting Member
4. Scientific Officer's Report
5. *Labour*—
   (*a*) Labour Department
   (*b*) Recruiting and Emigration
   (*c*) Enticement of advanced labour to emigrate
   (*d*) Non service of Warrants

Tuesday, 7th July, Afternoon.

6. Weights and Measures
7. Roads and Communications —
   (*a*) Arsikere-Mangalore Railway

Afternoon,

8. *Agricultural Matters*—
   (*a*) Pests and Diseases and Pest Act
   (*b*) Fertilisers
   (*c*) Products
9. *Rubber*—
   (*a*) Ceará Rubber
10. *Legislation* –
    (*a*) Prevention of thefts of Rubber, Pepper and Cardamoms
11. *Coffee*—
    (*a*) Hybridisation
    (*b*) Markets
    (*c*) Adulteration
12. *Planters' Chronicle*

WEDNESDAY, 8TH JULY. MORNING.

13. *Scientific Department*—
    (*a*) Retention of Services of Scientific Officer
    (*b*) Proposed Office of Mycologist
    (*c*) Assistants
    (*d*) Bulletins
    (*e*) Scientific Officer's Programme 1914-15
14. Planters' Benevolent Fund
15. *Tea* -
    (*a*) Markets
    (*b*) Railway Freight on Tea Seed

AFTERNOON.

16. *Finance*—
    (*a*) London School of Tropical Medicine
17. Rules of the U. P. A. S. I.
18. Election of Office Bearers

The Annual Report of the Secretary.

THE LABOUR DEPARTMENT.

Gentlemen,—This Meeting has been convened unusually early this year, on account of the establishment of a Labour Department of your own. The year of planting politics, with the exception of the Labour Question, has been a very quiet one. It will be within your recollection that an Extraordinary General Meeting was called in March last which was attended by Delegates from every District Association except one. The whole question was threshed out, and it was unanimously decided to start a Labour Department. Notices were sent to all members of District Asssciations, non-members, Firms and Companies interested in the Planting Industries of Southern India. The Executive Committee of the Labour Commission, with the sanction of your Chairman, decided, in response to the support accorded to the scheme to publish as widely as possible the fact that the Department had started from July 1st, 1914. Setting out with an objective of 100,000 acres at Rs.2 an acre guaranteed for 5 years, I am pleased to report that 95,122 acres have given in their adhesion to the scheme. This alone represents a sum of Rs.1,90,244, or £12,682 a year, or £68, 410 for five years. But it is reasonably to be hoped that more supporters will come in, thereby largely increasing this amount, and consequently your sphere of influence, usefulness and authority. The decision arrived at is the most momentous in the annals of your Association. The unstinted thanks of your Association are due to the Hon'ble Mr. Barber, Mr. Abbott and Mr. Nicolls for the unselfish devotion they have shown in your interests.

It is to be regretted that Mr. Aylmer Martin, your Commissioner, is unavoidably absent from your final discussions, but his absence at home for reasons of health precludes his presence, but you will all be glad to hear that his health has been nearly completely restored, and that he is most anxious to return and assume his duties.

The details of the working of the Department rest in your hands, and it is to be hoped that, after mature consideratiou, you will place this vexed question on a firm and lasting basis.

THE SCIENTIFIC DEPARTMENT.

You must all miss from this meeting the presence of Mr. Anstead, the Scientific Officer, who has sent out from home his report, which, with the permission of the Chairman, I will read out to you later on. You will have to

discuss the handing over of the Scientific Department to the control of the Government of Madras, but in connection with this matter I shall have to read out to you when the matter comes up for discussion a letter received from the Govenment of Madras in answer to one I addressed them about the appointment of a Mycologist in conformity with a resolution passed at the last meeting, but the gist of that answer lies in para. 3, where the Madras Government propose that this Association will provide "an aggregate contribution of Rs.15,000 a year for five years, at the close of which period the rates of contribution shall be subject to a reconsideration." I may here say that I do not think that the funds of your Association can stand such a strain.

The Government of Madras has sanctioned the purchase of a motor car for the use of the Scientific Officer. If this falls through through lack of funds, and Mr Anstead's services are retained for a further period of 5 years, your contribution to Government will be increased by Rs.1,032 making in all Rs.4,036. The subject of the publication of Mr. Anstead's papers, published in the *Chronicle* in book from, will come up for discussion later on. Mr Anstead is representing this Association at the International Rubber Exhibition and will publish articles on it in the *Chronicle*.

Mr. Jonas, Scientific Assistant (Coorg) resigned in December last, and no one has as yet been appointed in his place.

Green Bug

Green bug, I am sorry to say, continues to spread through the Coffee Districts of Mysore and Coorg, but I am glad to report that every planter is alive to the necessity of combating this pest Many able articles have been written in the *Chronicle* dealing with it, notably those contributed by Dr. Coleman, Mr. Bainbrigge Fletcher, R. N. and your Scientific Office.

H. E. the Viceroy's Visit.

H. E. the Viceroy visited South India last year and accepted addresses from the Coorg and North and South Mysore Planters' Association.

Weights and Measures.

The Weights and Measures Committee appointed by the Government of India toured through South India collecting information and opinions, and Mr Aylmer Martin, who represented this Association, replied to the questions put to him; but so far I have seen no report issued by the Commission.

Freight on Rubber.

During the year I have been in correspondence with the Ceylon Planters' Association and Straits Planters' Association with a view to getting a reduction of freights on Rubber, and I received notice that the Colombo Homeward Conference had reduced the rate of freight on rubber in cases from January 1st, 1914, to 60 shillings for 50 c. ft. or 20 cwts, until further notice.

East India Coffe Au tralia.

I have also corresponded with the Minister of Commerce, Australian Commonwealth, with the object of gainging a foothold in the Australian markets for East India Coffee, and through his kindly offices have received numerous letters from varions firms. These letters I have had printed and distributed and trust that they may be found of use to coffee planters.

Railway Construction.

Since the last annual meeting there has been considerable activity in railway construction in Mysore and that work is in progress connecting Arsikere with Mysore,

The Benevolent Fund.

The Planters' Benevolent Fund to June 30th, 1914 has Rs.17,000 invested in Government Paper at 3½ per cent. held by the Mercantile Bank of India in safe custody, and a balance at the Bank of Rs.1,712-0-2. During 1913-14 four applications were made for assistance and were sanctioned. These amounted to Rs. 850. A report of the Benevolent Fund from January 1st, 1913, to December, 1913, is placed before each Delegate.

The "Chronicle".

The *Planters' Chronicle* shows a profit of Rs.3,050 and is Rs.50 in excess of the estimate, of which Rs.1,525 is the half share of the Association.

Finances.

The accounts for the year are laid on the table. A comparison of actuals with estimate, shows the follwing results :—

	Estimate.	Actual.
Income ...	Rs.17,652 1 0	... Rs.19,448 10 0
Expenditure ...	Rs.15,169 0 0	... Rs.16,951 10 3

Though Rs,1 782-10-3 more were spent during this year the actual expenditure includes a sum of Rs.2,647-11-6 incurred on behalf of the Labour Department, which will be refunded and we have therefore spent Rs.865-1-3 below the estimate.

Chairman's Address.

Gentlemen,

In opening my Address, let me at once congratulate you on the success of what we have been endeavouring to attain for years past.

Through the energies of the very capable Committee whom you elected last year, together with the sporting manner in which Messrs. James Finlay and Co., have come forward in offering us the goodwill of their already well organized and successful Labour Agency, thereby saving us from many of the mistakes a newly formed organisation of this nature must necessarily incur; we have achieved the great aim of our ambition by starting the Labour Department on July 1st, 1914, and by the raising of sufficient funds for the equipment of what we all feel sure will be a thoroughly organized and well founded Labour Department, and to these Gentlemen, comprising the Committee, together with those responsible for the conduct of Messrs. James Finlay & Co.'s affairs, we are due a very considerable amount of gratitude.

As our worthy Secretary has humourously shown, week by week, in the *Chronicle*, through the medium of his Barometer, the figures, though at times stationary, have gradually risen up to their present gratifying stage; and although there are even now some waverers, who are doubtless sitting on the fence until they can see more clearly what good is to be attained by this new departure, still we must all hope, that as time goes on, everyone will place himself under the one Banner of Unity.

Unity, Gentlemen, is strength, and therefore the more we can unite ourselves into a strong combination of Self-Protection the greater will be our chance of gain in the end. Some may say that the Rs.2 per acre is a large sum to pay for what we are likely to get, but in my opinion it is but a small premium to lay out for practically safe-guarding our advances, this quite apart from its numerous other probable advantages. I should say there are few of us here to-day, who can say that they have not lost heavily in

the past through dishonest Kanganies or Maistries, and this point added to the fact that we shall be more likely to get the coolies when we most require them, makes the charge an insignificant one, compared to what we are likely to gain.

In Mr. Aylmer Martin, our Chief Superintendent, we are indeed fortunate in having a Director for the Department in whom we can place every reliance. A man of undoubted capability, energy and perseverance, and who will, I feel confident, ultimately place our interests on the highest level. I know you will, with me, wish him a safe return from England, fully restored to health, and also every success in his future undertaking.

The year under review has been taking it as a whole a fairly prosperous one. The rather scanty rainfall of last year together with the prolonged drought of this dry weather has had its disastrous effects in most districts. Still, crops have been good and Coffee and Tea prices well maintained. The low price of Rubber at present prevailing, is a matter for regret, but is it satisfactory to know from experience and from statistics and other articles published from time to time that, in all well founded and not over capitalised concerns in S. India, there is still, even at present prices, room for a considerable margin on the right side. The lowering of the freight on Rubber, by the Shipping Combine, will also materially assist this,

We have had to contend with a more or less severe attack of green-bug in parts of Coorg and Mysore—this, no doubt, also the outcome of phenomenally long drought, but with the preventative measures that have been, and are being, taken to allay its spread and the prospects of more normal seasons in future, we do not think there is much cause for any serious alarm. I should like here to thank the Mysore Durbar for their courtesy in allowing us, in Coorg the previlege of a visit from Dr. Leslie Coleman. Dr. Coleman made a short tour in the Province and gave the planters there much valuable advice in connection with green-bug and other things. To Mr. Bainbrigge Fletcher, Government of India Entomologist, our thanks are also due for his kind labours in this direction.

In November last the Coorg and Mysore Associations sent Deputations to meet H. E. the Viceroy in Mysore City, when suitable addresses, bringing all important local matters to H E's notice, were presented.

In December at the kind invitation of the Director of India Agriculture, I was a visitor, together with the Hon'ble Mr Barber, at the meeting of the Members of the Board of Agriculture held at Coimbatore, and we spent a very enjoyable and interesting week there.

We congratulate the South Mysore Association on attaining its Jubilee during the past year. An uninterrupted spell of 50 years existence, and doing good work throughout it all, is an eloquent tribute to the value and usefulness of Planters' Associations generally, and again emphasizes the point I wished to convey at the commencement of my address—that is, the value of unity amongst us all.

The South Mysore Association deserve our sympathy in the great loss they, and the planting community as a whole, have sustained by the death of that fine old planter Mr. Graham Anderson, C I E, whose charming personality, and ideas on planting politics generally, made it always such a pleasure to meet him.

The absence, from our Agenda Paper of the "Theni Bridge" and the "Vaigai Valley Railway" items is a matter for satisfaction, as it no doubt denotes that, through the efforts of this United Association in the past, those

directly concerned with the above projects have obtained all they could reasonably expect. There also appears to be every chance of the Arsikere-Mangalore Railway being put in hand at an early date, and this is a matter for sincere congratulation. As this work progresses Planters in Coorg hope that Government may see its way to giving them a "feeder" line. That this would be a great boon to them is unquestionable.

The non-execution and other difficulties connected with warrants, etc., in, and from, Native States are still subjects, gentlemen, that will want our most careful consideration at this meeting. We have hitherto made various attempts at removing, or at any rate, minimising them, but unfortunately with little or no success. Such a non-success has, I fear, made a few of our present Component Associations dissatisfied with the benefits they derive from the United Association, as they look upon redress in this matter as one of the most important. However, in view of the starting of our "Labour Department" it becomes doubly essential that the strongest steps should be taken to thoroughly represent to the respective Governments the great disabilities under which we suffer by the above, and I hope this will be done.

Mr. Anstead, our Scientific Officer, as you all know is now in England on a well earned holiday. Up to the time of his leaving he was, as usual, most energetic in helping us generally with the different problems we have had, from time to time, to face, and I feel that I but echo the sentiments of all present here now when I say that his assistance and advice have been most valuable.

It may interest many of you to know that he has been visiting the Rubber Exhibition. He will doubtless glean many useful hints from there which all of us interested therein will get the benefit of later on. While the retention of his services is still under the sympathetic consideration of Government, it is generally understood that our expectations will be realised. It is felt that if Government took over our entire Scientific Department, and, in co-operation with ourselves, ran it, the Department would still further develop, and such a consummation would, I think, meet with general approval.

Gentlemen, this, I understand, is the last meeting at which we shall have the pleasure of welcoming The Hon'ble Sir Hugh Daly.

On behalf of us all, I should like now to thank him for the unvarying interest he has always shown in all planting matters by attending our Meetings so regularly and doing us a good turn wherever he could. Planters in Coorg have special reasons for appreciating this, for, as their Chief Commissioner, he has always shown a kindly and sympathetic feeling towards them, and done all in his power to help, whether it be in starting new Industries, or other things.

I know you will all be with me when I wish himself and Lady Daly, when the time comes for their retirement, many years of happiness in the Old Country.

Our Planting Member, the Hon'ble Mr. Barber, has been of great help to me throughout the year, help always given with unfailing courtesy and readiness, and I am very grafeful to him for it.

As Secretary too, of your Labour Department Committee, he has given us much of his valuable time, but in connection with this Committee, it would be invidious to specialize, for, in my opinion, each member of it has done, not only what we expected of him, but a great deal more, and I feel sure that when the time comes you will accord them a most hearty vote of thanks for their able and unselfish labours on behalf of us all.

I also thank our Ex and Vice-Chairman for the past year, for their assistance, whilst to our able Secretary, Mr. Fletcher Norton, I am greatly indebted for his loyal support throughout. If rumour be true, I also think *we*, belonging to the Labour Department, owe him a special vote of thanks for his able advocacy of our cause, not only in the columns of the *Chronicle* but also on private occasions, when at various chance meetings with friends who were at that time 'waverers' he was able to let them see things in what *we* consider the "right light" and thus swell our acreage total and bring what we believe will be an undoubted boon to a greater number.

Gentlemen, the Accounts are now in your hands, and I trust you will find them satisfactory and in order. During the year, each member of your Finance Committee received a copy from the Secretary and was thus enabled to keep in complete touch with all matters relating to this heading.

I have nothing more to say except to ask your forbearance, if my "Report" is not quite as complete, or lucid, as those many of my more able predecessors in this Chair have given you.

I have however, tried to do my best and can now assure you that, however indifferently put in this Report, all our interests have, ever and always, received my most careful attention, whenever it has been possible for me to do so.

The Planting Member's Report.

Gentlemen.

Whatever there be of importance, will come up during the debate, so I will be very brief. I am glad to think that the Arsikere-Mangalore Railway matter is nearly through and that merely a few details as to terms remain to be settled. The Government of Madras are unable to contribute to the London School of Tropical Medicine as there is to be a School in India which will require their support and should have our support also if we can give it. The tropics would seem a more natural place for a School of this sort, and hope it will be started in Madras. The Labour Department and Scientific Department, I need not refer to now.

At the instance of the Wynaad Association, the Government of Madras asked the Mysore Durbar to authorise the Patels of the State to attest labour contracts. This the Durbar is unable to agree to on the ground the Patels in their present state of literacy cannot be expected to make satisfactory attesting officers. I have now suggested that Post Masters in Mysore should be appointed, and this suggestion is being put to the Post-Master General, Madras.

In regard to thefts of rubber, etc, two resolutions were passed last year, and I understood that I was not wanted to take any action until the Cochin Durbar had passed a regulation dealing with this matter. The Durbar passed this Regulation on the 23rd April last, and I have asked the Government of Mrdras if similar legislation can be brought in.

The negotiations regarding Cinchona failed to come to anything, but I believe Government have decided definitely not to plant Cinchona on the Anamalais but to extend their plantations on the Nilgiris

Other subjects that have had my attention are of purely local interest and need not be referred to here.

I should like to express my appreciation of the kind hearing I have invariably had from all those officials I have been brought in contact with in work, and in this connection I would especially mention the name of Sir John Atkinson, who is now retiring after long years devoted to the service of his country.

Annual Report of the Planting Expert.

1st July, 1913 to 30th June, 1914.

Mr. Chairman and Gentlemen,

I have the honour to present to you my fifth Annual Report as Planting Expert and Scientific Officer to the U. P. A. S. I. This Report takes the usual form, being a summary of the work done by the Scientific Department during the year under review, detailed discussions of pests, diseases, manures, &c., are left to be dealt with under their separate headings on the Agenda Paper of the Annual Meeting.

Office and Correspondence.

My office staff throughout the year has consisted of one writer and one peon, and the upkeep of this staff was met, as in former years, by a contribution from the Government of Madras.

On 21st March I left Bangalore to proceed on six months leave in England.

The arrangement and preliminary cataloguing of the Library has been completed and brought up to date. The U. P. A. S. I. have accumulated many valuable records in the form of Government Publications and Scientific Periodicals, etc., and a large number of Agricultural Bulletins and Papers are annually bought, or received in exchange for the *Planters' Chronicle*, and I think it is desirable to now publish a printed catalogue of these, and endeavour to arrange a scheme by which the library might be made use of by planters in the various districts.

As in past years office work has been heavy and it continues to absorb so much time when I am at headquarters that it is impossible to undertake any serious research work. 595 letters have been received and 613 written, these being the figures for nine months only, since during the last three months of the period under review I have been on leave, and all these have received my personal attention.

Publications.

I have as usual contributed regularly to the pages of the *Planters' Chronicle*, maintaining weekly a special section dealing with the Scientific Department and agricultural matters of general interest, and in addition I have contributed 12 special articles. The publication continues to be issued as a weekly and now yields such a handsome revenue to the U. P. A. S. I. that steps might be taken to reorganise its arrangement so as to make it a still more valuable and interesting scientific journal dealing with Southern India products, and to use its pages for the discussion among planters themselves of subjects of equal interest and importance to the Labour Question.

Owing to the press of other work it has been found impossible to find time or opportunity to issue special Bulletins dealing with Agricultural subjects, and with the present lack of staff all idea of being able to do this has been abandoned. At the last Annual Meeting of the U. P. A. S. I., however, I offered to collect the contributions which I have made to the pages

of the *Planters' Chronicle* during the past five years, and to arrange and re-edit them to be published in book form by the Association subject to certain conditions which were laid down in a subsequent letter to the Chairman and discussed at the Extraordinary General Meeting held on 11th and 12th of March last. Sufficient support has, however, apparently not been found to render this proposition feasable.

Herbarium and Collections.

Little work has been done on these during the year, but a few sheets have been added to the Herbarium, chiefly of plants collected in Peermade, and a few insects have been collected and sent to the Government Entomologist at Coimbatore.

A proposal made last year to establish a museum at the head office at Bangalore of products, pests and diseases, etc., of interest to the planters of Southern India has remained little more than a proposal. To make such a scheme a success volunteers are necessary and would be warmly welcomed, and it is possible that use might be made of the Exhibition which has become a feature of the Annual Meeting as a base for such collections.

Tours.

During the period under review I have been absent from headquarters for 96 days on tour. Visits of inspection have been paid to the Shevaroy Hills, Malabar, Cochin, Travancore, Peermade and the West Coast ; two tours have been made in Coorg, one in company with Mr. R. Birnie, the Agricultural Officer of the Kalisyndicate, in connection with the Manurial Experimental plots in that district, and one accompanied by Dr. Coleman, the Director of Agriculture of the Mysore Government, who, at the special request of the Coorg Planters' Association, was given permission by the Mysore Durbar to make a tour of inspection in Coorg with special reference to the Lantana eradication work, the outbreak of Green Bug and the planting industries generally of the District. The tour was a most successful one and I trust it will be repeated, and the idea extended to other Agricultural Officers. There is much to be gained on all sides from such tours as this. Not only do the planters and myself get the valuable benefit of the advice of such officers, but they themselves are able to obtain an insight into the problems which confront the European planters and broaden their outlook, and such visits do much to dovetail together the work of the various Agricultural Departments and enable the men in charge to work together more easily and profitably.

In December I attended the eighth meeting of the Board of Agriculture held at Coimbatore in my official capacity as a member of the Board.

These tours have necessitated my travelling a distance of 3,000 miles by rail and 1,718 miles by road, which is a considerable advance on the mileage covered during 1912-13.

Scientific Assistants.

Mr. G. N. Frattini, the Scientific Assistant for Mysore, has carried out his duties in that district throughout the year in a satisfactory way. A large proportion of his time has necessarily been taken up with work upon the unfortunate outbreak of Green Bug on the Coffee, but he has also devoted a considerable amount of attention to manurial problems, especially the important question of the possibility of the co-operative system of buying manures. The Kalisyndicate Experimental Plots in Mysore have been in his charge, and demonstrations have also been given of the use of Dynamite

in Agriculture. During the year a small laboratory has been fitted up and equipped for his use, and it is earnestly to be hoped that he will be allowed time to use this for the purpose of making soil analyses, checking fertiliser guarantees, and testing the value of fertilisers from local sources, etc., and that all his time will not be frittered away in more or less useless and unnecessary estate inspections.

Mr. Jonas, the Scientific Assistant for Coorg, proved unsuited to the work and the climate and resigned his post in December. It is hoped to appoint his successor before the end of the current year.

No other Assistants have been appointed, though one at least is badly needed in the Rubber Districts on the West Coast.

EXPERIMENTAL WORK.

The remarks made in my Annual Report last year still apply to this subject. The difficulty of carrying out field experiments which must often be continued over a long period of years under most careful supervision on estates is apparently insurmountable. There is a great reluctance among planters generally to carry out any organised experiments, and during the rush of work at crop time and other seasons the experiments are invariably neglected. The planters are not altogether to blame for this, and to a great extent it must necessarily be the case. In fact, experiments carried out here and there on estates without the skilled supervision of the scientist who has planned them can seldom yield any results worth having, and too much risk is run from want of continuity. The proper place to carry out experiments is at an Agriculture Station, where they are under the eye and control of the Scientist who is conducting them, and such a Station is one of the most urgent needs of the Association if its Scientific Department is to be continued on practical and efficient lines.

Despite the difficulties outlined above a few experiments have been carried out during the year, chiefly in Mysore and Coorg, where the Scientific Assistants have been able to more or less supervise them, but the success which has been obtained with these is almost entirely due to the keenness and energy of a few planters who have taken them up and carried them through with unflagging zeal, and to these men my personal thanks are due as are those of the whole planting community for whose benefit the results have been published.

The most important of the experiments alluded to have been—

(1) *Manurial Experiments with Coffee.*

The Kalisyndicate Manurial Experiment Plots laid down in Coorg and Mysore, have been carried through their first stage. On a few some preliminary figures have been obtained but the general result has been to show that they are too much trouble for most planters to undertake, and several men have after one year's trial of them given notice that they are not willing to continue them. Possibly this is not due altogether to lack of interest in manurial problems, but to the fact that the Scheme as at first outlined was too complicated, though it raised no criticism whatever when it was published in the pages of the *Planters' Chronicle*. In order to try and meet the difficulties and prevent, if possible, the abandonment of the work altogether of the generous offer of the Kalisyndicate, a simpler scheme has been drawn up as a basis of future work and this has been published. I would like to take this opportunity of expressing my thanks to Mr. Birnie, the Agricultural Officer of the Kalisyndicate, stationed in Bangalore, for his valuable aid, and for the unflagging enthusiasm with which he has supported me in the somewhat disheartening task of carrying through an unpopular piece of work.

The experiment with a manurial system based on a chemical analysis of the soil and the past history of the estate reported last year has been continued and results have now been obtained over a period of three years. Briefly stated the crop has been doubled during this period and the high yield maintained. Many other estates have now adopted a similar system and manurial schemes have been drawn for them and it is to be hoped that in time all estates will adopt similar manurial programmes under the advice of the Scientific Department.

(2) *The Conservation in pits of Composts of pulp and line sweepings, etc.*

Work on this subject has been continued and results obtained have been reported in the *Chronicle* from time to time.

(3) *The Effect of Fertilisers on the Latex yield of Ceará Rubber.*

Work done during the year on a larger scale has confirmed the results obtained in 1912-13, and the experiments as far as they have gone, tend to show that, on areas which do not normally yield well, the application of both Nitrate of Soda, and Saltpetre, just before tapping is begun, increase the flow of latex and the yield of rubber, but that on areas which normally yield well these fertilisers apparently do not improve the conditions. Much work still remains to be done before any definite conclusions can be arrived at and the experiment is being continued.

(4) *Bees and the Fertilisation of Coffee.*

The experiments begun during the blossom season of 1913 in co-operation with the Government Entomologist were carried through, but at present the final report on this work has not been prepared.

(5) *Coffee Hybridisation.*

The Experimental Plot established in the Nilgiris in 1912 is in excellent order and under the able supervision of Mr Butcher, Curator of the Nilgiri Parks and Gardens, the Coffee is making rapid growth. No actual crossing work can of course be begun until the trees reach the flowering stage.

In Coorg some Experiments with Hybrids under estate conditions are being carried out and the clearings have made remarkably good growth.

In Mysore work is being continued at Chundrapore and elsewhere and a sample of coffee prepared from fifth generation trees elicited a very favourable report at Havre.

With the advent of Green Bug into Mysore and Coorg it may become necessary to reconsider the question of which generation and type should be selected for propagation and this aspect of the work is being carefully kept in view.

Pests and Diseases.

During the year under review no new pest has been recorded. Brown Scale (*Lecanium hemisphæricum*), and the yellow Bark Louse (*Aspidiotus camelliæ*) were reported on Tea, and the Die-back disease, due to a combined attack of two fungi, *Gloesporium alborubrum* followed by *Botryodiplodia theobromæ* continues to cause a certain amount of damage on Hevea Rubber Estates. Red Spider (*Tetrarychus bimaculatus*) was found damaging Tea and other crops.

The most important pest has again been the Green Bug on the Coffee estates of Mysore and Coorg. With the advent of the dry weather it was

found that this pest had become established despite the drastic measures taken to deal with it earlier in the year, and even areas which had been spur pruned and sprayed were reinfected. The exact method of infection still remains a mystery, but it would appear that whatever it may be it is still operative. The parasitic fungus is widely spread in both districts and its presence did much to check the scale during the monsoon, but that this alone will not eradicate the pest has been amply proved. Systematic spraying must be adopted, and it is important that the pest should be dealt with promptly directly it is noticed and every effort made to prevent its spread and the infection of the shade trees, and at the same time an organised campaign must be carried out against Ants which protect, foster and spread the scale. Every effort is being made by the Scientific Department to combat this pest which may seriously affect the Coffee industry in Mysore and Coorg, by carefully studying the life history of the scale under the local conditions obtaining in these Districts, making a careful survey of the areas affected and a study of its food plants in addition to Coffee, trials of sprays and sprayers, and literature both in pamphlet form and in articles in the *Chronicle* describing the Scale and the methods to be adopted in checking and controlling it. In all this work Dr Coleman, the Director of Agriculture for the Mysore Government, has most willingly and enthusiastically co-operated, and his services have proved of immense value, especially with reference to the Native Coffee planters in Mysore, who are just as anxious as the Europeans to protect their Coffee from this rightly dreaded pest.

Pest Act.

During the year the Destructive Insects and Pest Act, 1913, has been passed as the outcome of representations made by the Bombay Chamber of Commerce as long ago as 1906. This is a step of the utmost importance and it clears the way for the introduction of local legislature for the control of pests and diseases in circumscribed areas for which the Association have so often asked.

Laboratory.

Owing to the time occupied in touring and administrative work, very little chemical work has been done in the laboratory and no definite piece of research could be undertaken. That there is so little time available for laboratory work each year is a cause of increasing regret. A few samples of fertilisers have been examined as to their manurial value and few analyses of miscellaneous products, but beyond this little use has been made of the laboratory.

The Scientific Department.

At an Extraordinary General Meeting of the U. P. A. S. I. held in Bangalore on 11th and 12th March the future development of the Scientific Department was briefly discussed and at that meeting I had the honour to explain my views upon this subject, and there is no need to do more in this Report than to briefly summarise the proposals then made, *viz.*, that it is necessary, if the Scientific Department is to be developed along efficient and useful lines, to (*a*) establish an Agricultural Station, (*b*) to appoint a Mycologist, (*c*) to appoint more Assistants on the Staff, a man to study Rubber problems on the West Coast, and an Assistant at Headquarters to do either analytical work or to lighten the burden of correspondence from the head of the Department being especially needed and (*d*) to devise some method of setting the Planting Expert free to do more research work and less office and administrative work.

RUDOLPH D. ANSTEAD,
Planting Expert.

BAROMETER

OF

Labour Department.

	100,000
11-7-14	95,434·21
4-7-14	94,450·41
27-6-14	90,219·41
20-6-14	89,619·41
13-6-14	88,574·41
6-6-14	86,429·41
30-5-14	84,867·41
23-5-14	82,851·41
2-5-14	82,293·90
25-4-14	79.820
18-4-14	77,958
11-4-14	74,607
4-4-14	73,057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We have no addition to make to our Barometer, but would call special attention to Mr. Richardson's letter, correcting a most unfortunate and misleading report that occurred in the *Madras Mail* of the 9th and which will remove all misunderstanding. We hope that now that the Labour Committee is complete, that subscribers to the Department will accord them their full confidence and support. It will take some little time to set things going, but we are instructed to say that as time goes on, full reports will be published in the *Chronicle* of the progress made. The Committee of Control consists of the Chairman, Mr. Abbott (acting for the Hon'ble Mr. Barber), Mr. Pinches, Mr C H. Browne, Mr. Aylmer Martin (at home) and another from the Kanan Devans, whose name has not yet reached us.

Mr. Day has been wired for to come out as soon as possible to take up his duties as Deputy Director and Mr. Aylmer Martin should be with us about 1st October.

A new Association has been formed called the Travancore Combined Planters' Association, the first proceedings of which we publish.

It will be noted that Mr. Anstead, Planting Expert, has been honoured with the degree of M. A., and we have to thank him for sending out the account of the International Congress of Tropical Agriculture, and also the account of the opening ceremony of the Rubber Exhibition. He has promised to send further accounts for publication in the *Chronicle*.

Mr. Birnie furnishes us with a letter on Fertilisers, and will not continue the controversy.

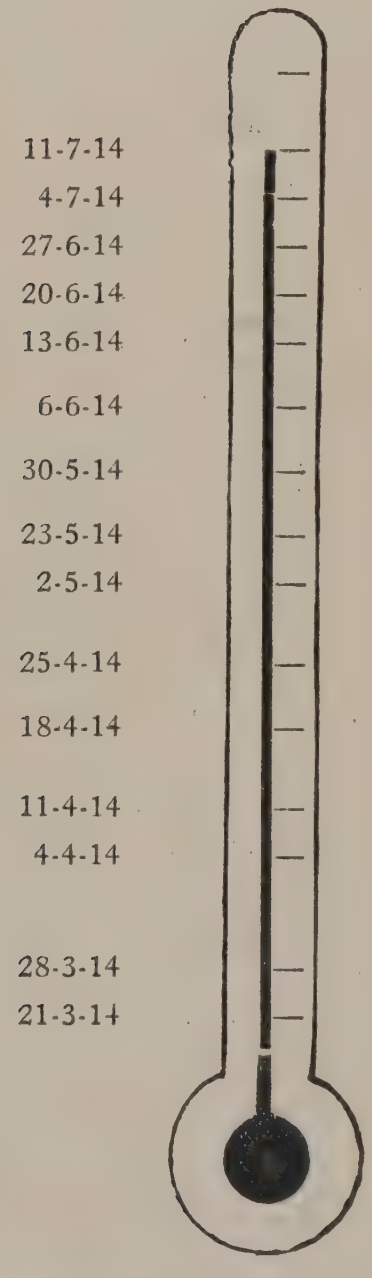
We hope that all Honorary Secretaries will begin to collect subscribers to the Book of Proceedings for 1914. It will not be a very big book this year, but interesting as regards the Labour Department and the Scientific Department.

Also the Secretary will very shortly be circulating reply post-cards inviting the Planting Community to guarantee, by registering their names, the publication of the contributions of Mr. Anstead in book form.

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

Travancore Combined Planters' Association.

A Meeting of representatives of the following Associations was held at the Quilon Club, on 30th June, to consider the proposal of the South Travancore Planters' Association to form a combined Association for Travancore.

Central Travancore Planters' Association.
Mundakayam Planters' Association.
South Travancore Planters' Association.

PRESENT.—Messrs. J. S. Valentine, J. A. Richardson, J. B. Cook, L. G. Knight, H. B. Kirk, P. T. Alexander, R. Ross, A. W. Leslie, M. M. Knight, A. Moore, V. Mardon, A. Mackie, C. Hall. *Visitors:*—J. Mackie (Messrs. Harrisons & Crosfield, Ltd.,) E. J. Smith, R. N. W. Jodrell and J. A. Gwynne. Mr. J. S. Valentine was elected to the Chair.

The election of Office Bearers for the ensuing year, which was referred to the Delegates of the Associations represented, was proceeded with and the result announced to the meeting was Mr. J. S. Valentine, Chairman, Mr. J. A. Richardson, Vice-Chairman and Mr. J. A. Gwynne, Honorary Secretary. It was agreed that the Executive Committee should consist of the Chairman and Honorary Secretary for the time being of each Association and the Planting Member of the Travancore Legislative Council, with power to add to their numbers. The Chairman, Vice-Chairman and Honorary Secretary are members of the Executive Committee *ex-officio*.

It was proposed that the Executive Committee should frame the rules of the Association and submit them to the next meeting to be held if possible at the time of the Sri Mulam. The Honorary Secretary was asked to obtain the Rules of the U. P. A. S. I. and Ceylon Planters' Association and to draft out rules on the same lines for the guidance of the Executive Committee.

It was agreed that the Hony. Secretary should approach the Commercial interests of Cochin, Alleppey and Quilon and invite their co-operation in appointing a Delegate from each town to represent them on this Association and also communicate with the West Coast, North Travancore and Kanan Devan Planters' Association to the same effect. As the interests of Cochin and Travancore are more or less identical, it is hoped that they will join the Association.

It was suggested that the Executive Committee fix the rate of subscription at Rs.25 per annum for each Association and each Commercial firm.

With so many planters present the opportunity was taken to discuss matters of immediate interest and at the request of the Chairman, Mr. Richardson made a short speech on the subject of the Labour Commission which lead to an interesting discussion, the consensus of opinion being that so far as the estates on this coast were concerned the Commission would not benefit them.

The state of the roads and communications in Travancore came up for discussion and it was remitted to the Delegates to bring the matter before their respective Associations with a view to taking combined action.

The question of engaging a Mycologist was favourably discussed and this matter was also remitted to the Delegates to bring before their Associations.

(Signed) J. A. GWYNNE, *Hony. Secretary.*

THE PLANTING EXPERT HONORED.

At a Congregation of the University of Cambridge held at the Senate House in Cambridge on 20th June, the Vice-Chancellor, the Provost of King's College, in the Chair, the degree of Master of Arts was conferred upon R. D. Anstead, Esq., B.A., the Planting Expert.

The International Congress of Tropical Agriculture.

The International Congress of Tropical Agriculture at which Mr. R. D. Anstead, M.A. is representing the United Planters' Association of Southern India opened its Sessions at the Imperial Institute on 23rd June. The following account of the opening meeting appeared in *The Times*.

"The King, who is patron of the International Congress of Tropical Agriculture now meeting in London, sent yesterday the following message of welcome to the Delegates: —

"It is with much pleasure that I welcome to London the Delegates of the International Congress of Tropical Agriculture. The importance of their deliberations and the number and variety of subjects to be discussed are of especial interest to me. I trust that their discussions will contribute to the advancement of agriculture in the Tropics—GEORGE R. I."

"There was a large audience of Delegates when the Congress opened in the morning at the Imperial Institute. They were welcomed by the President, Professor Wyndham R. Dunstan, F. R. S., who is also President of the International Association for Tropical Agriculture and Director of the Imperial Institute. The morning session was occupied by the President's Address, in which he reviewed the whole field of tropical Agriculture, and in the afternoon papers were read by a number of authorities on technical education in tropical agriculture.

"There was general agreement in the desirability of a College in Ceylon which was described by the President in his address. Later in the afternoon Mr. J. Arthur Hutton described the work of the British Cotton Growing Association.

"In the evening Lord Emmott, Parliamentary Under-Secretary for the Colonies, presided at a dinner given by the Government to the Delegates and representatives of the Congress at the Imperial Institute. The Government held a reception afterwards for the Congress, for which about 2,000 invitations were issued. The guests were received by the Secretary for the Colonies and Mrs. Harcourt.

THE PRESIDENT'S ADDRESS.

After pointing out the ever-growing importance of the agricultural productivity of the tropics, to which the temperate world had now to look for numerous materials necessary to life and to industry, the President discussed the problems connected with the most important of these tropical products. The first he touched upon was rubber.

Since the last Congress four years ago, he said, an immense impetus had been given to the cultivation of rubber, and a rapid unprecedent rise in the market price of the raw material followed. Rubber trees of every description were grown in plantations on a large scale, of which Hevea, Ceara, and Castilloa were the most important. Certain conclusions were already definitely indicated, but two questions remained. One was the maintenance of an ample supply of cheap labour for the plantations of the Eastern tropics; the other was the quality of the plantation rubber compared with

that obtained from the trees of South America. The artificial production of rubber by chemical means had now been satisfactorily accomplished by laboratory methods. Some time must elapse before we could be certain that these methods could be successful on a large scale. The question would then arise as to whether synthetic rubber could be produced cheaply enough to compete with the natural rubber. The improvement of plantation rubber and the cheapening of its cost were therefore the main problems for the rubber grower. The moral of synthetic indigo was obvious. Natural indigo was killed because little or nothing was done to improve and cheapen its production and he believed this was fully recognized by leading rubber planters. But the entire science of rubber-growing needed continuous investigation by trained specialists.

Cotton, Cocoa, and Tobacco.

Another subject which would claim much of their attention was cotton-growing and its improvement. Notable advances had been made, especially in India, in Nyasaland, Uganda, Togoland and in French West Africa, but continuous effort and experimental work were needed in each country in which cotton cultivation promised success.

In this country at the present time we were specially and financially interested in a large attempt, chiefly due to the initiation of Lord Kitchener, to grow Egyptian cotton under irrigation in the Gezira district of the Anglo-Egyptian Sudan. Lancashire spinners would view with satisfaction a similar development on the opposite shore of the Mediterranean. Asia Minor appeared to offer a promising and very large field for the growth of long-stapled American Upland cotton. With the development for cotton-growing in these great tracts in Egypt, the Sudan and in Asia Minor, the demands of Europe for two of the principal grades of cotton would in a very large measure be met, and the principal manufacturing requirements of the Old World largely supplied from within its confines. Important advances also were being made in cotton cultivation in India.

After referring to the oil-yielding trees, the President spoke of the remarkable increase in the production of cocoa in the Gold Coast. An output of 11,407,608 lb, in 1905 had risen to 45,277,606 lb. in 1910, and last year it was 113,239,980 lb., and this country now, he said, stood first on the list. The cocoa industry of the Gold Coast was a notable example of an enterprise which had been brought to success as a native industry aided, and to some extent supervised, by Government, but without pressure or coercion in any form.

Recent developments indicated that certain kinds of tobacco might not only be grown, but successfully cured, of satisfactory quality in a number of new areas, among them Canada, South Africa, including Rhodesia and Ireland, while promising trials were being made in this country. The subject needed increased attention in the tropics, especially in relation to the growth of cigar tobacco.

The Imperial College in Ceylon.

The time had now come, the President continued, to consider how education in tropical agriculture could best be provided. What was now urgently required was an Agricultural College in the tropics which should also be an important centre of tropical agriculture research, not merely for its own advanced students, but for trained investigators of special subjects from all parts of the world. There was general agreement that Ceylon was the colony best adapted for the establishment of the first Imperial College of

Tropical Agriculture. The funds required were estimated at about £50.000. The site proposed was at Peradeniya, in proximity to the famous Gardens and also to the Government Agricultural Department. Instruction would be open to all who produced the diploma of an Agricultural College or other evidence of possessing the preliminary knowledge requisite. As educated and otherwise properly qualified native students would be admitted, as well as European students, it was intended to erect in proximity to the college at least two residential hostels. The entire course of work would occupy a period of one year, which would be continuous, and the cost of board, residence and instruction for this year was estimated at £150.

The President next said he desired to submit to the Congress the question of a British Institute of Tropical Agriculture on the lines of other professional bodies, such as the Institutions of Civil, Mechanical and Electrical Engineers and the Institute of Chemistry. He thought such an institution would be welcomed by all connected with the subject of agricultural production in the British tropics. It would be affiliated with the various agricultural societies in the British tropics and with the International Association, and would, with great advantage, take over the work at present performed by the British Committee of the Association.

Tropical Hygiene.

The Delegates attending the International Congress of Tropical Agriculture resumed their deliberations at the Imperial Institute, South Kensington, yesterday.

Under the Presidency of Sir Ronald Ross the Congress discussed the question of sanitation and hygiene on tropical estates, and later, when Sir Sydney Olivier was in the chair, considered the subject of legislation against plant diseases and pests.

Dr. Harford (President of Livingstone College) said there were groups of men in all the different countries of Europe who were united to deal with the question of the supply of liquor to natives, which he believed had an important bearing on the efficiency of labour in the tropics. Some practical results had issued from the discussion of this subject at the last Congress. Belgium had enacted entire prohibition of the trade in spirits throughout the whole Belgian Congo. Portugal had take similar action in the province of Angola, and France, Germany and Great Britain had taken strong steps in Africa during the last few years.

Sir Sydney Olivier said that if agriculturists could be interested in the question of labour efficiency they would probably render great assistance in matters which had hitherto been regarded purely as problems of hygiene and medical aid. In all tropical countries he was convinced that a large amount of the apathetic disposition of labourers was due to latent disease which depressed their vitality. Our experience in all our Colonies was that any Government who spent a few thousand pounds on drainage could effect an enormous saving in the life and the health of its inhabitants; but we had to be constantly on watch for altered conditions. In different parts of Jamaica they had considered that they were immune from malarial fever, but when they sent labourers to Panama a somewhat different shade of malaria was contracted and infection resulted when they returned.

Sir Ronald Ross suggested that the Congress should appoint a standing Committee to consider the whole question of sanitation and hygiene on tropical estates.

A resolution giving effect to Sir Ronald Ross's suggestion was carried.

RUBBER.

The Rubber Exhibition.

The following account of the opening ceremony of the Rubber Exhibition appeared in *The Daily Telegraph*.

Prince Arthur of Connaught yesterday formally opened the fourth International Rubber and Allied Industries Exhibition at the Royal Agricultural Hall, Islington, and, in so doing gave great encouragement to those engaged in what he described as a "wonderful industry," for he expressed the view that rubber would, in due course, in its own sphere of production, prove as profitable as the production of gold.

The opening ceremony took place on the rubber tennis court, in the presence of a large company. Sir Henry A. Blake, the President, was in the chair, and among those present were Mr. Lewis Harcourt, M. P. Secretary of State for the Colonies, and Mrs. Harcourt, Captain Eric Bonham (Equerry to Prince Arthur), Mr. A. Staines Manders, organising manager, and Miss D. Fulton, Secretary to the Exhibition; Mr. John McEwan, Chairman of the Rubber Growers' Association: and the Commissioners sent over by various British protectorates and dependencies, and by foreign countries, to represent them at Islington.

In asking His Royal Highness to declare the exhibition open, the President said that was the third of a series of exhibitions which had been held in London in connection with the rubber industry. The first was in 1908 and the second in 1911. The objects of the display were primarily to bring together the rubber producers of all countries and the manufacturers, with a view of increasing their knowledge of the necessary conditions for the successful planting, growing, preparing and marketing of rubber, and of stimulating the discovery of new lines of expansion for its uses. Beyond that there would be until July 9th, a series of conferences at which papers would be read and discussed by practical experts from every part of the rubber-producing world. That the exhibitions had been so successful was due in a great measure to the energy and organising ability of Mr. Staines Manders, the organising director, (Hear, hear).

Development of Rubber.

Prince Arthur of Connaught, who on rising was greeted with applause, said: After the interesting speech to which we have all listened, I feel that it would be mere presumption on my part to detain you long on the question of synthetic or any other form of rubber, of whose comparative merits I confess that I am entirely ignorant, but I may say that I gladly complied with the request that I should open this exhibition, for I am firmly convinced that few things tend more to the welfare of mankind than that men of all nations should from time to time meet together for the promotion of branches of industry to which they are devoting their brains and their lives. (Hear, hear.) Consequently it is a source of very great satisfaction to me to welcome to-day the official Delegates from so many different countries who are assembled here, and are engaged in amicable trade rivalry with ourselves, for the purpose of stimulating the growth of this wonderful industry. (Hear, hear.)

There is an old saying to the effect that "every dog has his day," and from the innumerable prospectuses which used to cover—I dare not say "litter" (laughter)—my writing-table every morning, I think I can safely say that rubber is having, and will continue to have, its day. (Cheers). The

latter half of the nineteenth century was essentially the gold mining era, but I do not think that I am far from the mark in saying that the glutinous product which is found in a variety of trees in Africa, Asia, and South America, and which has been introduced with such success into Ceylon, the Malay States, the Straits Settlements, and elsewhere, will in due course, in its own sphere of production of the golden mineral in the future. (Cheers). I feel that I am laying myself open to the accusation of dabbling or investing in rubber shares-(laughter)-so I hasten to deny the impeachment, but I do feel that a boom in some department of industry would be very welcome, so why not another in rubber? (Hear, hear).

I believe I am right in saying that the first specimens of crude rubber were brought to Europe by La Condamine in 1735, but nothing was made of the raw material until 1770, when Dr. Priestley called the attention of the public to its value for erasing pencil marks. Charles Macintosh, early in the nineteenth century, introduced waterproofing cloth, which really marks its beginning as a commercial product. Since then, thanks to that Veteran of travel Sir Clements Markham, who did so much towards the introduction of the cinchona cultivation to the East, and to the skill of Mr. H. A Wickham—(cheers) seeds of rubber-bearing trees were first transported to Kew Gardens, and then sent to Colombo, Burma, Mauritius, Singapore, Java, and Fiji, which has led to a very rapid development, something like 70,000 tons being exported to this country in 1913.

Not unnaturally, however, this enormous production is for the moment in excess of immediate requirements, which has occasioned a fall in prices-hence the reason of this exhibition, to show the people of this country the variety of purposes and uses to which the material can be applied, and which offers such a vast untrodden field for future commercial enterprise. (Hear, hear). It only remains for me to wish this exhibition every possible success, and to say that I feel convinced that it will conduce in no small measure to the advantage of this important and ever-growing industry for the benefit of mankind in general (cheers).

The Fall in Price.

Mr. Lewis Harcourt, who followed, observed that he was officially deeply interested in the rubber production of the British Empire. It was an industry whose birth within our territories coincided only with the dawn of the present century, but its growth in that time had been beyond expectation and belief. Last year the exports of rubber from the Straits Settlements, the Federated Malay States and Ceylon alone reached the extraordinary total of 71,000,000 lb. in weight of the value of £11,000,000 sterling. The production of the first five months of this year showed that the total output of 1914 was likely far to exceed anything that had preceded it. (Cheers). It was quite true that the price per pound had fallen, which was naturally regarded from different points of view by different individuals. Those who would mostly be seen at that exhibition were the consumers, and to them the fall in price might be described-like another commodity as grateful and comforting. (Laughter).

Mr. John McEwan, in thanking the Prince for his presence, stated that the Rubber Growers' Association celebrated the seventh anniversary of its birth that day. Its interests were with plantation rubber only, and it nnmbered 583 company members and 219 individuals. It represented a land area of 2,271,000 acres, of which 665,000 acres were planted in rubber, and the issued capital of its companies was £42,750,000, but many of the shares stood at large premiums. (Hear, hear.)

COFFEE.

Brazil.

Coffee Trade of Sao Paulo.—The following information is from the report by H. M. Consul at Sao Paulo (Mr. G. F. Altee) on the trade of the State of Sao Paulo in 1913, which will shortly be issued:—

The number of bags of coffee exported from the State of Sao Paulo during 1913 was 10,229, 245, as compared with 8,934,719 in 1912.

The Coffee trade during the first half of the year passed through one of the most serious crises in its history. January started with type 4 coffee quoted at 7'8 milreis per 10 kilogs. (*i.e.*, the Santos arroba); with very few fluctuations the price then declined steadily till the end of June, when the quotation was only 5'8 milreis. This heavy drop equals 16*s.* a bag of 60 kilogs) and can only be attributed to a series of exceptional circumstances. Among these was the tightness of money in Europe, and some important failures in some of the chief markets of consumption which made credit more difficult to obtain from bankers. The bull speculators being unable to finance their positions, were obliged to liquidate as best they could, and the excessive height to which they had forced prices naturally curtailed consumption; the demand during all this period was very irregular and only on a small scale. The last two crops also produced more than the prominent bulls had estimated and speculated on. These factors upset the whole coffee trade, and a general feeling of uneasiness prevailed.

Many of the most prominent dealers bought steadily in June for September delivery, paying an advance of 200 to 300 reis on the prices for June delivery.

During the second half of the year, the season commenced on relatively low prices and some 2,000,000 bags were sold at low rates. During September, news was received from the interior that prospects for the next crop (1914-15) were very poor, and that it would be one of the smallest known for the past twelve or fifteen years.

Following this, heavy entries and monetary embarrassments brought about a decline, and with constant rumours of failures and curtailment of credit the price dropped to about 5-15 milreis. The foreign markets are reported as being well supplied, and Santos still holds a stock of some 2,400,000 bags. On the other hand it must be taken into consideration that prices around 50 milreis per cwt. are attractive to the Sao Paulo trade generally, and in particular to the consuming markets, as they must leave a fair margin of profit.

1,000 reis = 1 milreis = 1*s*, 4*d*.

—*The Board of Trade Journal.*

A Perfect Fertiliser.

Professor Bottomley's discovery of a perfect fertiliser is of intense interest to Australia. He has produced a bacterialized peat, which absorbs the nitrogenous wealth of the atmosphere. The exhaustion of nitrogen by crops is the cause of the decay and death of soils. For soils die just as do all other living elements in nature. They become senile, because of exhaustion. The purpose of fertilisers is to arrest that exhaustion, and to revivify the earth. Rain always brings down large quantities of the free nitrogen of the atmosphere; hence its incalculable value as a revivifier of the land. But much of the nitrogen thus brought down escapes. With a fertiliser such as that now discovered by Professor Bottomley, the nitrogen cannot easily escape before it becomes absorbed by the soil. Exchange.—*Queensland Agricultural Journal.*

Cathcart House,
Palace Road,
Bangalore, 16th July, 1914.

A CORRECTION.

Labour Department.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—My attention has just been drawn to a most unfortunate error in reporting my remarks on the starting of the Labour Department in the *Madras Mail* of the 9th. I clearly stated that those not coming in the Labour Department before the date of our next General Meeting would be asked to pay an entrance fee of one Rupee over and above their yearly subscription of Rs. 2 per acre not an entrance fee of Rs. 3 as stated by the *Madras Mail.*

This is a most unfortunate error and I am afraid will lead to a great deal of correspondence and adverse criticism.

I shall be obliged if you will publish this letter in a prominent place in your next issue and also draw attention to the mistake in your editorial notes.

Yours faithfully,

J. A. RICHARDSON,

Chairman, U. P. A. S. I.

CORRESPONDENCE.

4 F, South Parade,
Bangalore, 8th July, 1914.

Fertilisers

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—It is not my intention to wage prolonged controversies on the respective merits of individual fertilisers. Data supplied by your Scientific Department will, no doubt, be at once more succinct and more appreciated by your readers than isolated facts elicited from me in a semi-socratic manner at weekly intervals. But in the *Chronicle* of the 27th ulto., "Nemo" appears to have commenced a catechistical campaign and has put to me three direct questions, failure to answer which on my part might be misconstrued by your readers. I, therefore, once more crave your indulgence and reply to his questions seriatim.

The answer to his first query is "Sulphate of Ammonia" or "Nitrolim," both of which, though not so readily available sources of Nitrogen as are the various Nitrates, are nevertheless of the class of quickly available nitrogenous fertilisers. The nitrogen in both is cheaper than in Saltpetre, taking the value of potash in the latter at the same price as in Muriate of Potash. In support of this statement, I give the following unit values:—

Value of Nitrogen in Nitrolim equals	...	Rs.9-7-7 per unit.
„ „ in Suphate of Ammonia	...	Rs.12-4-8 „
„ „ in Saltpetre	...	Rs.13-0-0 „ when Potash costs—Potash in Muriate.

From the above it is seen that Saltpetre is not the cheapest source of quickly available nitrogen when potash content is taken equivalent to Potash in Muriate.

His next query begins thus:—"Why does he say that the Nitrogen alone in Saltpetre should be considered, etc." Such a statement, Sir, being entirely erroneous, I decline to have attributed to me, and shall assume it is not intentionally made, but is only the outcome of the printer's error in mine under reference—(the correction of which appeared the following week). My statement was, of course, to the effect that in purchasing the nitrogenous fertilisers referred to, it is the amount of *Nitrogen* contained that is to be considered (*i.e.*, taken as the basis of purchase) whether the fertiliser be in the form of Nitrate, Sulphate, Cynamide, etc.

When "Nemo" compared Saltpetre with Imported *Nitrates*, the only inference to be drawn was, his having compared the *nitrogenous* element of Saltpetre with that of the other Nitrates for, as comparisons can only be made of things of the same kind, the potash in itself cannot be compared with "Imported Nitrates" which, of course, contain no similar plant food. I, therefore, intentionally avoided all reference to Potash.

But as "Nemo" now emphasises the Potash element, I shall extend my original statement, *viz.* "It (Saltpetre) is not, by any means, the cheapest source of quickly available Nitrogen obtainable in India," to include the words, "nor is it the cheapest form of Potash obtainable in India," for:—

Value of Potash in Saltpetre equals Rs. 3-15-1 per unit when N costs N in Nitrolim

" Potash in Saltpetre " Rs. 3-3-0 per unit when N costs—N in Sulphate of Ammonia

" Potash in Muriate " Rs. 3-0-0 per unit.

Hence Potash in Saltpetre is not the cheapest form of Potash when N content is taken equivalent to N in Nitrolin or Sulphate of Ammonia.

All the above figures are calculated from quotations given in a current year's catalogue received few months ago, copies of which your readers will, no doubt, find among those obtained from local firms.

Finally, *re* his last query. Both Sulphate of Potash and Saltpetre are freely soluble in water and readily dissolve, any difference being of chemical interest and not of agricultural moment. Similarly with Muriate. Apart from other considerations, Sulphate (and Muriate) of Potash can be applied at any time—as labour conditions suit—without suffering loss. On the other hand, if Saltpetre be employed, it must only be applied when growth is taking, or about to take place; otherwise loss of Nitrogen will follow.

"Nemo" will recall that his first letter on the subject bore reference to Coffee. More particularly with Coffee and other perennial crops partaking of the nature of orchards, a fertiliser giving a steady and gradual supply of available nitrogen throughout the year is much to be preferred to one in which the nitrogen is all immediately available and which cannot be economically supplied in quantities large enough to give all the nitrogen required—one, indeed, providing such crops merely with a stimulant, with a "feast, followed by a famine."

I have trespassed, Sir, somewhat largely on your space and, having assumed that "Nemo" is the layman on the subject, as implied in the opening sentence of his letter, I have replied to his queries at length. I do not, however, intend to participate further in a controversy which, I am inclined to think, can only be of interest to the initiator, and the matter, as far as I am concerned, is now closed.

Yours faithfully,

R. BIRNIE.

Retaming Cement.

THE EDITOR,

The Planters' Chronicle,

Bangalore.

Sir,—I should be much obliged if you or any of your readers could inform me of the method of grinding or "retaming" cement which has got damp and hardened into lumps in the barrels.

"ARNL".

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

There is no change in the Barometer to record this week.

That it may not escape notice we re-publish an occasional note from the *Madras Mail* : " The Secretary of State has sanctioned for a further period of five years the appointment of Mr. R. D. Anstead as Scientific Adviser to the Planting Community of South India."

We publish the proceedings of the Annual General Meeting of the Kanan Devan Planters' Association. We should much like to see the excellent example set by the Kanan Devans in publishing their various acreages followed by every District Association. It would be of such useful assistance to the Secretary's office.

A small extract from the Quebec Assembly Bill dealing with the protection of plants from Destructive Insects and Fungoid Diseases as bearing in a way on the Pest Act that this Association wish to have introduced over certain specified areas, is interesting.

So much has been written and so many books have been published about Coconuts that we publish an article from the *Daily Telegraph* which one of our contributors has kindly sent us. Some of our members, we believe, are interested in Coconut cultivation, and will read with interest the bright prospects held out to them. Let us hope these war alarms will not interfere with them.

A valuable article written by Mr. E. A. Andrews for the Indian Tea Association, Scientific Department Quarterly Review, which may be of aid to tea planters in South India is reproduced In this issue.

We are not in the habit of drawing in our contents page special notice to our advertisements, but we think no apology is required when attention is called to the Clincher Motor Tyre. A trial has been made with these tyres made with plantation rubber and the experiment has proved to be eminently satisfactory. The writer of the notice says " As it has been frequently stated that plantation rubber is not suitable for Motor Tyres " he thinks the above notice will be welcome to rubber growers.

BAROMETER

OF

Labour Department.

	100,000
25-7-14	95'471
11-7-14	95,434'21
4-7-14	94,450'41
27-6-14	90,219'41
20-6-14	89,619'41
13-6-14	88,574'41
6-6-14	86,429'41
30-5-14	84,867'41
23-5-14	82,851'41
2-5-14	82,293'90
25-4-14	79.820
18-4-14	77,958
11-4-14	74,607
4-4-14	73,057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

Kanan Devan Planters' Association.

Proceedings of an Annual General Meeting held in the High Range Club, Munnar, on the 27th June, 1914.

PRESENT.—Messrs. C. Fraser (in the Chair), A. J. Wright, A. Blair Hill, A. G. Murray, G. W. Cole, J. M. Bridgman, A. Yates, A. W. John by his proxy Mr. A. J. Wright and E. A. Hughes (Honorary Secretary). *Visitor*: Mr. E. L. Hammick.

The notice calling the meeting having been read the minutes of the previous Extraordinary General Meeting, were read and confirmed.

The following Agenda was then laid on the table.

(1) Chairman's speech.
(2) Honorary Secretary's Report.
(3) Accounts.
(4) Scientific Officer.
(5) Bangalore Delegate.
(6) Condition of the Northern Outlet Road.
(7) Correspondence.
(8) Election of Office-bearers.

On opening the meeting the Chairman said that he regretted to see that so few members were present, but this was fully accounted for by the extremely inclement weather. He had not very many remarks to make and with the permission of the meeting he would ask that the first 2 items on the Agenda be reversed and after hearing the Honorary Secretary's Report, if there was anything he wanted to remark upon, he would then do so.

The Hon. Secretary then read his report, as follows:—

Mr. Chairman and Gentlemen,—I beg herewith to submit my report on the working of the Association for the past year. The following are the figures showing the various acreages under cultivation at present:—

Tea	...	18,797	acres
Coffee	...	1,037	,,
Cinchona	...	541	,,
Cardamoms	...	1,411	,,
Sisal	...	429	,,
Cocoa	...	20	,,
Camphor	...	114	,,
Rubber	...	781	,,
Timber	...	1,082	,, or a total acreage under cultivation 24,212 acres.

The total crop of tea from the District for the year is 8,218,904 lbs., as against 8,659,059 lbs. last year, or a reduction of 440,155 lbs. This reduction can be explained I think entirely by the unfavourable climatic conditions we experienced. There was one of the severest frosts on record during the early part of the season which was followed by a severe drought and the monsoon was none too favourable. The average yield on the mature tea

was 537 lbs. which we may consider satisfactory under the conditions. The other products Coffee, Cinchona, Cardamoms, Sisal, Rubber, &c., are all progressing satisfactorily and giving good results. The year under review has been a fairly successful one. The average price obtained for our teas was about 8·75*d.* as against 8·32*d.* last season which is very satisfactory and points, I think, to the fact that the High Range teas are becoming more appreciated on the markets. Reports show that markets are expanding and I think prospects all round for tea may be considered very satisfactory.

During the year 6 Committee Meetings, 2 Finance Committee Meetings and 3 Extraordinary General Meetings have been held.

THE MEDICAL GRANTS were regularly paid by the Government and I am sure we are all very grateful to His Highness' Government for their generosity. I regret that in spite of the large increase in the number of local dispensaries, the Government have not yet seen their way to any further increase in the grants. We can only hope that this will eventually be obtained.

THENI BRIDGE.—I am pleased to be able to state that at long-last our old friend, the Theni Bridge has been completed and disappears from the Agenda. The road also between Periakulam and Bodinayakanur has been greatly improved. All this is due entirely to the efforts and interest of Mr. A. R. Knapp, the Collector, Madura District, and I have had the pleasure of writing to thank him in the name of the Association as per your instructions.

THE DEPUTATION TO MEET LORD PENTLAND.—Your Association sent a Deputation to meet His Excellency, the Governor, with reference to the Light Railway we all shortly hope will be constructed between the foot of the Hills and the S. I. R. Lord Pentland was extremely sympathetic but was unable to make any definite promises. It would appear however that steady progress is being made, that Government are willing to grant a sum of money to the Madura Local Board towards its construction and I think we can shortly look forward to one, or the other of the 2 proposed routes being taken in hand.

FINANCIAL POSITION.—The question of the financial position of the Association is somewhat serious as our income at present falls far short of our requirements. There are at present 35 estates on the books paying a subscription of Rs.10 each and cess of 2 annas per acre on the cultivated area, exclusive of Timber. The whole of the 2 anna cess is at present paid to the U. P. A. S. I., which leaves an available balance of about Rs.350 against estimated requirements of Rs.1,000 The Finance Committee you appointed have decided to recommend that the subscription per member be raised to Rs.30 per annum which will put the Association upon a sound financial basis.

POSTAL SERVICE.—I am glad to say that the Postal service has been run during the year without any serious difficulties and given general satisfaction, but regret to have to report that we have lost Mr. N. S. Varada Charya who was the District Superintendent of Post Offices who was unremitting in his efforts to help us and improve the service in every possible way.

SCIENTIFIC OFFICER.—The question of the Scientific Officer is still a doubtful one. Mr. Anstead is at present on leave and I have not yet definitely heard as to whether Government intend to allow him to work for the U. P. A. S. I. We have decided, in the event of a change being made, to

revert to our old rate of subscription and also to recommend that the whole Scientific Department be taken over by Government.

GAME LAW.—The Government are putting through the Law for the better protection of Game and though perhaps not going quite as far as we had hoped, it may be considered satisfactory.

THE L. A. N. I.—The Association still pays its subscription to this and I believe many Members have found it of considerable benefit. It was decided after considerable discussion and consideration that the retention of the services of a local Nurse was not feasible.

THE SRI-MULAM POPULAR ASSEMBLY DELEGATE.—Mr. Wright was our Delegate at the Sri-Mulam Assembly and you all have heard the report of his work which I am pleased to say was most successful. We note with satisfaction the new District Munsif has arrived and taken up his duties. I suggest our Association thanks Government for the ready response to our request.

BANGALORE DELEGATE.—During the year I had the honour of attending the U. P. A. S. I. Meeting as your Delegate. The Proceedings have been printed and circulated. Perhaps the most important subject that we have had to consider for some years, is the proposed Labour Department for the U. P. A. S. I. You are all aware of the conditions under which it is to be started and although I regret to say the proposal has not met with support I think it deserves, I think you will all agree with me that it is a necessity and will be of the utmost benefit to all concerned.

WEIGHTS AND MEASURES.—The Imperial Committee appointed by the Government to inquire into the question of the Standardization of Weights and Measures, is working steadily and we must hope, will be able to arrive at some satisfactory settlement.

I had the honour of again being elected Vice-Chairman and Member of the Finance Committee of the U. P. A. S. I. which I greatly appreciated and which I feel reflects greatly to the credit of our Association.

The Chairman then said :—It is now my pleasing duty having heard Mr. Hughes' very lucid and careful report of the year's working, to move a very hearty vote of thanks to him both for it and the work he has done during the past year. Many members are under the impression that the duties of a Chairman of an Association like ours entail a good deal of work, but I can assure you, thanks to Mr. Hughes' energy, in this case it is not so, I have really had very little to do and the burden of the work has been borne by our Honorary Secretary. I am sure that you will agree that he has looked after the interests of the Association most carefully and carried out his duties most effectively and efficiently and has given entire satisfaction to us all. The vote was carried unanimously.

The Chairman continuing said he had not very much more to say in view of the very interesting report they had just heard. The figures given with regard to the various items of cultivation showed that steady progress was being made and the rise in prices for our teas was most satisfactory and he hoped it would be maintained.

It was very satisfactory for them all to know that the Theni Bridge had at length been completed and that the road between Periakulam and Bodinayakanur had been put in decent order. This was entirely due to Mr. Knapp's efforts and the Association had already thanked him.

As mentioned in the report the Deputation to His Excellency Lord Pentland with reference to the Light Railway, met with the most kindly and sympathetic reception. He might mention that in the course of conversation, he was surprised to learn that the Governor scarcely knew of our existence and was astonished when told of the progress and up-to-date conditions that maintained in the High Range. He thought that there was one lesson to be learnt from this and that was to make yourself known and if you had any reasonable request to keep pegging away at Government until you obtained what you hoped for. He thought he could assure them that the work of constructing the Railway would be shortly taken in hand as he had heard that the Survey of the Railway line to Bodi had been completed and that the District Board was only waiting for the report and estimate to take steps for financing and starting the undertaking. The line is a simple one and should be rapidly completed.

The financial position of the Association was fully explained by Mr. Hughes and efforts are being made to put the Association's finances on a sound business basis.

With reference to the Scientific Officer they could only wait until they heard what Government intended to do before taking any further steps in the matter.

With regard to the new District Munsiff so readily granted by His Highness' Government for our convenience, he begged to move that the Hon. Secretary be asked to write and thank His Highness' Government for their ready response to our request. Carried unanimously.

The Chairman then said that at the last Extraordinary General Meeting they had unanimously elected Mr. Hughes as their Delegate at Bangalore. But since then, unforeseen circumstances had arisen which prevented Mr. Hughes attending. As Mr. Pinches was going to Bangalore on behalf of Messrs. James Finlay & Co. and with reference to the proposed Labour Department he thought they could not do better than ask Mr. Pinches to be their Representative. This was carried unanimously.

There was one subject in which the Association was deeply interested and that was the formation of the new Labour Department of the U.P.A.S.I. Although he was not one of those who joined he fully sympathised with the views of those carrying out the project. He felt it would be a benefit to all concerned and hoped that if the proposal was brought to a successful issue it would strengthen their hands in dealing with their Maistries and coolies and be of benefit to all concerned.

In conclusion, the Chairman said that it only remained for him to thank them all for the way they had helped him in carrying out the work of the Association for the year.

Mr. Wright said that he wished to move a very hearty vote of thanks to Mr. Fraser for the work he had done for them and the keen interest he had taken in the Association's welfare as Chairman. They all knew that Mr. Fraser had worked and done his best and they had all benefited by his experience and knowledge. The vote was seconded by Mr. Bridgman and carried unanimously.

The 3rd item of the Agenda was then taken up and the Honorary Secretary said with regard to accounts: I have already explained to you the present position as regards our income and expenditure. The increased subscription if sanctioned, will square matters. The books and Balance Sheet are on the table for anyone who wishes to look into them. The

figures for the past year had been audited and certified as correct by Mr. Ingram and I beg to move a hearty vote of thanks to him for his kindly doing so.—Carried unanimously.

SCIENTIFIC OFFICER.—The Meeting decided that nothing further should be done in this matter until the Association knew definitely the intentions of Government. They were unanimously of the opinion that it would be a great mistake if any change were made after Mr. Anstead had made himself so fully acquainted with their various requirements, for it would take a new man fully 2 years before he began to get a grip of things.

CONDITION OF THE NORTHERN OUTLET ROAD.—Mr. Wright then brought forward the following resolution :—

"That this Association records with extreme regret that no improvement has yet been made in the deplorable state of the Northern Outlet Road ; metal has been prepared on several points and the Association begs respectfully to urge upon Government the urgency of adequate steps being immediately taken to put the road in order."

This was seconded by Mr. Bridgman and carried unanimously. He explained that in particular the last 10 miles to Chinnar are in a really shocking condition. He had a report by Mr. Cole, the Chief Engineer of the Company, which any one of them might see. In various other places, too, repairs were urgently needed, and very little work had been done for some time past. He further proposed that the Honorary Secretary write to the Government, sending them a copy of the Resolution and asking them to take steps to have the road put into good order with as little delay as possible. Seconded by Mr. Yates and carried unanimously.

The Honorary Secretary said there was no correspondence of importance to place before them for consideration.

The Chairman, Honorary Secretary and Committee then resigned and Mr. Bridgman was elected to the Chair whilst balloting took place for the Office-bearers for the coming year.

The Ballot resulted as follows :—

Chairman	...	C. Fraser, Esq.
Honorary Secretary	...	E. A. Hughes, Esq.
Committee	...	J. M. Bridgman, Esq.,
		A. Yates, ,,
		A. J. Wright ,,
		A. G. Murray ,, and
		H. L. Pinches, ,,

In returning thanks the Chairman said he very highly appreciated the honour the Association had done him in again electing him as Chairman. He could assure them that he would spare no efforts to forward their interests in every possible way. Before sitting down he would just like to impress upon the Members, old and young, the latter particularly, the importance of considering and studying the agendas of the various meetings in detail. He particularly hoped that in future the younger members would come forward and express their views upon any subject in which they are particularly interested. They all knew there were many old heads on young shoulders, and he had no doubt the Association might receive valuable suggestions from younger members if they would only come forward and express their views. He thanked them very heartily for the honour they had done him in electing him Chairman.

Mr. Hughes returning thanks, said: It is a great honour you have done me in re-electing me Honorary Secretary which I highly appreciate. I have always taken the keenest interest in the welfare of the Association and I shall do my best during the coming year to give you every satisfaction in the discharge of my duties. I trust you will overlook any shortcomings or omissions of which I may be guilty, and I beg to thank the Chairman, Committee and Members for re-electing me, for the kindly help and support they have always afforded me and also for the honour they did me in electing me as their Delegate at Bangalore.

Before concluding, I beg to propose that Mr. J. M. Bridgman be again elected to the Vice-Chair. This was seconded by Mr. A. G. Murray and carried unanimously.

Mr. Bridgman thanked the Association and a vote of thanks to the Chair terminated the proceedings.

PAPERS ON THE TABLE.—The U. P. A. S. I. Circulars, The Indian Association Circulars, Correspondence and Association books, etc.

(Signed) C. FRASER,
Chairman,

(,,) ERNEST A. HUGHES,
Honorary Secretary.

An Act Respecting the Protection of Plants from Destructive Insects and Fungoid Diseases.—*Quebec Assembly Bill*, No. 32, 1913.

Under this Act the Entomologist of the Department of Agriculture of the Province of Quebec is given the right to enter any nursery, orchard, or other premises where it is believed that plants are kept, and any resistance to this action is forbidden. The existence and spread of any insect pest must be reported, and all instructions regarding the treatment or destruction of infested plants must be carried out by the owners. After the Entomologist has ascertained the existence in a nursery of any one of the pests enumerated, no plants may be removed from that nursery until a certificate stating that they are fit to be transferred has been obtained from the Entomologist or his assistant. The Minister may authorise certain persons, for scientific purposes only, to import specimens of the destructive pests. No compensation for expenses incurred or damages suffered through the treatment or destruction of any plants, trees, or other vegetable matter attacked by any of the destructive pests shall be allowed by any Court when such expenses result from the instructions of the Entomologist. Among the destructive insects to which this Section applies are expressly included the San Jose Scale (*Aspidiotus perniciosus*, Comst.) the brown-tail moth (*Euproctis chrysorrhoea*, L.), the gipsy moth (*Lymantria* (*Porthetria*) *dispar*, L.), and the woolly aphis (*Schizoneura lanigera*, Hausm.) Between the 15th June and the 15th September of each year the Entomologist or his representative shall visit all nurseries in the Province in which plants are grown for commercial purposes, in order to ascertain the existence in such nurseries of any of the destructive insects or plant diseases, and if such insects are not present, a certificate shall be issued which is valid up to the inspection next year. Unless such a certificate is obtained, after the 15th December, 1914, every owner or person in charge of a nursery in the Province is forbidden to move any plant outside the nursery.—*The Review of Applied Entomology*.

WEALTH IN THE COCONUT.

From Obscurity to Industrial Pre-Eminence.

The romance of the Coconut will long survive to fascinate and to point a moral. Less than a generation back this product of tropical soil was deemed to serve no particularly useful purposes to humanity at large. Beyond furnishing a limited supply of oil, and having as its principal *raison d'etre* its uses as a native food and form of currency it seemed destined to remain for all time a negligible quantity. Now it occupies a proud place among raw materials indispensable to the necessities of our every day life. The evolution of the Coconut, indeed, is a remarkable commentary on the inexplicable way in which Nature effects her plans. But in a practical age it is the practical that alone matters. People would not be thinking and talking in terms of the Coconut if it had not emerged triumphant from obscurity to industrial pre-eminence. It is a prolific topic of interest, not merely because of the rapid developments with which it is associated, but because we have in the Coconut a staple commodity that takes precedence as a source of easily exploitable wealth. The highest authorities appear to be on sure ground when they hint that it will sooner or later constitute a leader among industries.

Copra and Coir Fibre.

The two principal Coconut products—Copra and Coir Fibre—are alone estimated to reach a value of £125,000,000 in the present year of grace. What the aggregate will be, say in 1917 dare not be suggested lest it might appear to savour of gross exaggeration. Apart from its swift expansion, due to increased cultivation and the adoption of approved scientific principles, the industry differs from all others in that it embraces raw materials which are in no possible danger of over-production. On the contrary, there is a marked dearth of Copra, while the demand is—and will always be—unlimited. The consumer is ever crying for more, and since Copra is the basis of nut-butter, or margarine, not to mention other articles of wide domestic use, the industry is assured of uninterrupted success. What, of course, has helped to render Coconuts famous has been the gradual shrinkage in the supply of animal fats the world over. As that shrinkage became more and more pronounced, the consumer was of necessity prompted to turn to the vegetable varieties. Chemical experiment did the rest. We know now that, whether in respect of the nutritive element or in the important matter of wholesomeness, the butter made from Copra is even superior to the product of the dairy. Copra, however, covers a multitude of uses, including the manufacture of lard, salad oil, soap, candles, pomades, and pharmaceutical compounds. Coir fibre, the other main product of the Coconut, furnishes the material for matting, ropes, cordage, cables, oakum, mattresses, brushes and a host more of household requirements.

Investment of Capital.

But why proceed? Why paint the lily? Seeing that many volumes have been written on the virtues of the Coconut, it is beyond human ingenuity to traverse the ground in the limited space of a single article. It is enough to establish that the Coconut is the mainspring, as it were, of more than one formidable industry, and is probably the shortest path to fortune of which the capitalist can avail himself. So far investors have looked on as disinterested spectators, while the comparatively few companies engaged in the pursuit of this most valuable tropical product have attained to a strength of position which cannot be measured at this juncture. It is no idle talk to say that the time is close at hand when Coconuts will be the medium of

enormous Stock Exchange traffic. All the ripples on the surface point to a movement the activity of which will be heightened by being long overdue. For the rise of and brilliant prospect for the industry might well have brought Coconut securities into fashion and favour at any period within the past two years. The conclusion is therefore irresistible that the judicious investment of capital in Coconut enterprises cannot fail to yield the best result. This, indeed, is the sentiment of Sir W. H. Lever, Bt., of Sunlight Soap, fame. To quote his own words:—"I do not think in the whole world there is promise of so lucrative an investment of time and money as in the Coconut planting industry." Sir William Lever, however, is not alone in singing the praises of the Coconut as a raw material capable of being more profitably handled than any other marketable commodity. There is the testimony of the numerous experts to the same effect. But we need not fall back on theory when there is so much evidence of a practical character. Coconut plantations yielded a good margin of profit when Copra fetched only £10 per ton. The present quotation of Copra is £27 per ton, and it is expected to realise an appreciably higher figure in the next few months.

Some of the Companies.

Considering these facts in all their bearings, one cannot but be impressed by the fine outlook for some of the pioneer enterprises, notable among which is the Eastern Palm Estates and Trading Syndicate (Limited), of 37-38 Mark-Lane, London E. C. From the hour of its inception the Eastern Palm Estates took solid rank as a Parent Company. Its interests are spread over the whole Coconut-growing area, and through its representatives in the principal centres of production it is enabled to furnish authentic information concerning any phase of the industry. More than one of its subsidiaries is already on the road to a useful and profitable future. Indeed, the Western Coconut Estates (Limited), which is only of recent formation, has in turn become an important Parent Concern, and bids fair to share the honours for enterprise and fruitful energy to which the Eastern Palm Estates can lay good claim. The Western Coconut Estates (Limited), with its extremely modest capital of £10,000 divided into 9,000 £1 Ordinary and 20,000 1s. Deferred shares, might well serve as a model for the sponsors generaliy of joint-stock ventures. At the onset it took over eight properties, with an aggregate area of 10,000 acres, 3,750 acres being freehold and 1,150 acres under cultivation with Coconuts, and returning instant and substantial revenue. Two of the eight properties, known respectively as the Greenwich Park and Good Hope, are shortly to be transferred to subsidiaries, and arrangements to this end are rapidly proceeding.

Coming Events.

But the achievements of the Western Coconut Estates (Limited), do not end with this excellent record for a brand-new enterprise. Quite recently it acquired three additional properties, of which one is sufficiently advanced in development to set out on its own career, and is now in course of being underwritten, with a view to its early appeal to investors. All the properties are situate in British Guiana, West Indies, a quarter of the Coconut-growing zone eminently adapted to the cultivation of the palm. The Western Coconut Estates (Limited), is thus seen to be in a powerful position, with three subsidiaries, about to be launched, and no less than eight separate areas remaining to be dealt with hereafter. When it is added that the properties combine all the features that go to the making of ideal plantations, and that they are favourably located for transport facilities, there should be little doubt about the shares proving a desirable investment. The details of the Western Coconut Estates (Limited), have been dealt with only

briefly, but supplementary information can be readily obtained on application to the Eastern Palm Estates (Limited), at whose office, 37-38 Mark Lane, London E. C., there is a mine of facts pertaining to the now famous Coconut industry, and at whose instance this column is inserted. From all appearances it is not unreasonable to look for an active Stock Exchange movement in Coconut shares before 1914 passes into history. The rise of the industry and the large profits earned by those engaged in it would alone justify such a movement.—*Daily Telegraph.*

Rubber Industry in German East Africa.

H. M. Consul at Dar-es-Salaam (Mr. N. King) reports that the low prices prevailing in 1913 had a disastrous effect on the *Manihot* rubber plantations in German East Africa. The set-back in the economic development of the Colony is a serious one, as rubber cultivation is one of its most important interests, there being probably 19,000,000 trees planted in the Colony, of which about half are ready for tapping. Owing to the low prices all the plantations limited the number of hands employed, and two of the largest suspended tapping entirely.

Planters have made urgent appeals to the Government for assistance, and some relief has been afforded. Unless, however, the price of rubber improves greatly, it is difficult to believe that any official measures will enable the planters to reduce their costs of production sufficiently to make the rubber-growing industry profitable. Railway freights have been reduced and the sea freight has been lowered from 90 marks to 50 marks (from about £4 4s. to £2 9s.) per ton, while the payment of Customs export fees has been deferred. Acids for the coagulation of rubber are imported free of duty, and the Colonial Economic Committee is endeavouring to obtain a reduced freight for materials used in collecting rubber.

The request of the planters for a further extension of the period of contract for labourers has not yet (26th February) been granted, and can hardly be expected in view of the fact that the Government has already extend to 240 working days the time for which contracts may be made. This new regulation came into force on 1st October, 1913, and its effects have not yet been felt very much on the plantations.

The planters are heavily handicapped by having to pay the costs of recruiting labour in the interior and its transport down to the plantation. These costs often amount to about £2 10*s.* per head before work is begun, and the rate of wages is high-about 16*s.* 6*d.* per month for a Wanyamwezi tapper.

Owing to a slight rise in the price of rubber, tapping has been resumed by some of the planters and a more hopeful feeling is abroad. The smaller planter has probably a better chance than the large company, his working expenses are less, he can often obtain local labour cheaply or get time-expired hands without paying recruiting fees and in addition he can keep his men under more personal control. The outlook for the larger estates is far from reassuring, and it is said that some of them have already begun to cut down the rubber trees to make room for other crops.

The Colonial Economic Committee is taking steps to introduce a standard quality of East African rubber, the absence of which is another difficulty which has hampered the planters. There is only one large washing and curing factory in operation in the Colony, at Muhesa, though there are several smaller ones in Usambara. Most of the planters wash the rubber themselves, with the result that it has often to be done again in Europe. —*The Board of Trade Journal.*

MOSQUITO BLIGHT.

A Note on the Relation between the Tea Mosquito (Helopeltis Theivora) and the Soil.

By

E. A. Andrews, B. A.

The question of the distribution of mosquito blight is one of considerable complexity. *Helopeltis theivora*, the tea mosquito, is more or less universally distributed throughout the tea districts of North East India, and yet it is only in certain districts that it does any considerable damage. Why should this be the case? And what are the controlling factors? These are two of the many questions to which this Department is endeavouring to find an answer and it is intended here to give a short notice of certain results which have been obtained during the prosecution of these endeavours. The investigatious are as yet by no means concluded, in fact they may be said to be only just begun, for the material available is but scanty. As, however, the results so far obtained are of considerable importance, they are given here, in the hope that they may prove to be of interest to all concerned.

A study of the distribution of mosquito blight in the Duars brings out the following points:—

The pest is worst in the extreme west, and, towards the east is, broadly speaking, worst in the gardens furthest from the hills. This is the area occupied by the grey sandy loam of the Duars, the remaining area being almost wholly Red Bank. Mosquito is severe, however, on certain Red Bank gardens. This might be considered to be due to one or two causes:—

1.—The Red Bank, being a richer soil than the grey sandy loam, the tea grown on it is naturally less liable to blight, and in the Red Bank gardens which get blight, the soil is somewhat deteriorated,

2.—There is some peculiarity in the grey sandy loam which is gradually being acquired by the soil of some of the Red Bank gardens.

At first sight the former appears to be the more plausible suggestion, but in the worst blighted part of Cachar, the Hoilakandy district:—

1.—The tea on the teelas, is ou the whole, less liable to blight than on the flats.

2.—The Tea on the stiff clay flats of the district is less liable to blight than on the bheel.

Here the tea growing on the richest soil is more liable to blight, and, also, the soil on which the tea is least affected, namely the teela soil, is distinctly similar, in chemical composition, to the Red Bank of the Duars. This seems to point to some peculiarity, which, if it be present in the grey sandy loam of the Duars, should be equally present in the bheel, and this is found to be the case.

Five samples from different parts of the grey sandy loam gave on analysis the following percentages of available potash and phosphoric acid:—

		I	II	III	IV	V
Potash	...	·006	·018	·010	·019	·020
Phosphoric acid	...	·049	·095	·024	·037	·034

The ratio of potash to phosphoric acid for these soils :—

		I	II	III	IV	V
$\frac{\text{Potash}}{\text{Phosphoric acid}}$	...	·122	·189	·416	·513	·559

Five samples from different parts of the Red Bank gave on analysis the following available quantities of the same constituents :—

		I	II	III	IV	V
Potash	...	·029	·019	·037	·012	·013
Phosphoric acid	...	·009	·009	·017	·008	·012

giving as the ratio of potash to phosphoric acid :—

		I	II	III	IV	V
$\frac{\text{Potash}}{\text{Phosphoric acid}}$	...	5·222	2·111	2·176	1·500	1·083

This ratio is, therefore, low in gardens on the grey sandy loam, and high on unblighted gardens on the Red Bank. Only one set of figures is available for a Red Bank garden which suffers from blight, but here the numbers are as follows :—

Potash	...	... ·013
Phosphoric acid	...	... ·018
the ratio being $\frac{\text{Potash}}{\text{Phosphoric acid}}$	...	... ·722

showing an approximation to that found in the grey sandy loam.

These facts are very suggestive, the more so as the figures for the teela and bheel soils give the same ratios. Thus, the analysis of five bheel soils show the following available quantities of potash and phosphoric acid :—

		I	II	III	IV	V
Potash	...	·009	·007	·009	·006	·009
Phosphoric acid	...	·031	·029	·032	·043	·031

giving as the ratio of potash to phosphoric acid :—

		I	II	III	IV	V
$\frac{\text{Potash}}{\text{Phosphoric acid}}$	...	·287	·241	·281	·139	·290

while those of five teela soils show the following available quantities of the same two constituents :—

		I	II	III	IV	V
Potash	...	·006	·022	·020	·013	·011
Phosphoric acid	...	·006	·008	·007	·013	·008

giving as the ratio :—

		I	II	III	IV	V
$\frac{\text{Potash}}{\text{Phosphoric acid}}$	...	1·000	2·750	2·857	1·000	1·357

Similar figures for the stiff clay flats cannot, unfortunately, be at present obtained.

Analysis taken in the unblighted districts of Assam, where mosquito is present but does no appreciable damage, show high numbers for the same ratio.

Thus it appears that one of the factors controlling the intensity of the attack of the tea mosquito is the ratio of available potash to available phosphoric acid. When this is high the pest is less likely to do damage than when it is low. In the present short note it is unnecessary to give the full analysis from which the ratios have been taken, but the following conclusions may be put forward now. So far as has been at present observed, one may say that mosquito blight is found on the tea planted in a variety of soils in which the actual and relative amounts of the different constituents may be very different, but that the tea planted in soils in which the ratio of available potash to available phosphoric acid is low will be more likely to be attacked by mosquito blight than tea planted in soil in which this ratio is high.

The above observations suggest that there may be the possibility of influencing the susceptibility of bushes to attacks of mosquito blight by manuring in such a way as to alter this ratio in the direction indicated above, that is to say, by applying potash manures to soils in which the potash-phosphoric acid ratio is low, so as to bring them into line with those on which mosquito blight is found to be less prevalent.—*The Indian Tea Association, Scientific Department Quarterly Journal.*

Artificials and Quality.

Has the general use of artificial feeding stuffs and fertilisers had a tendency, while increasing the bulk of animals as well as of crops, to lower the average quality?

Are our vaunted giant roots half water, our big crops of potatoes more prone to disease, the barley not up to the old standard, the hay not so nourishing? Is the stock on our farms more delicate and liable to be attacked by the germs of any disease that may be in the air?

It is sometimes asserted that the modern system of intensive soil and stock cultivation involves a departure from the laws of Nature, and will therefore bring its own Nemesis. Is this so? Are we really retrograding and abusing the means which science has placed at the disposal of agriculturists?

First, as to Artificial Manures.—If the quality of crops is not satisfactory, can this fairly be attributed to the use of superphosphate or basic slag, or Peruvian guano, or nitrate of soda, &c.? By no means, but to the injudicious employment of these useful materials. It is all very well for a farmer, who, having fed his crop with an overdose of nitrogen, is disappointed with the result, to talk of reverting to more natural conditions, but was not his treatment of the crop quite unnatural? If crops could speak, they would often upbraid farmers for the way in which they are treated. As they cannot speak, they show it by their appearance and at the time of harvest.

Man cannot live by bread alone, nor can crops flourish by applications of badly-balanced fertilisers. Farmyard manure and fertilisers must be applied so that each crop of the rotation is assured of a sufficient supply of ammonia, phosphate of lime and potash in proper proportions. This is practice and science, and if farmers would bear it in mind, we are confident that they would all be ready to acknowledge that the use of artificial manures is an advantage not to be be dispensed with in conducting farming operations to a successful issue.—*Mark Lane Express Agricultural Journal,*

The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Barometer has risen to 96,243'78, which is a distinct advance. We do not expect in these anxious times to have any great addition made to it. But when trade resumes its normal course, as it must shortly do, and a feeling of security, which has received a temporary check, revives men's minds will turn to their daily work, when we hope that the Barometer will receive their attention and their acreage.

In connection with our Labour Barometer and Labour Department, we would call attention to the small extract from the *Indian Planters' Gazette and Sporting News*, which shows by figures the enormous drains that are made on South Indian Labour by the competition for Labour, which the establishment of our own Labour Department will go a long way to regulate.

Those who read Mr. Aylmer Martin's interesting articles on Motherhood and Infancy on Estates, will read with equal interest a paper entitled Infantile Mortality by Dr. Angus Macdonald. The Housing of the cooly must take a more important place in planting than hitherto,

From the *National Review* we cull an article on Bugs, of which really very little is known, but this article as throwing new light on the subject should prove instructive.

The *Times* supplies us with an article on Rubber. New uses will be found for it, and it will be of daily consumption and increasingly used; but until this war is over it is useless to do anything practical, but there is time for the inventive and imaginative man.

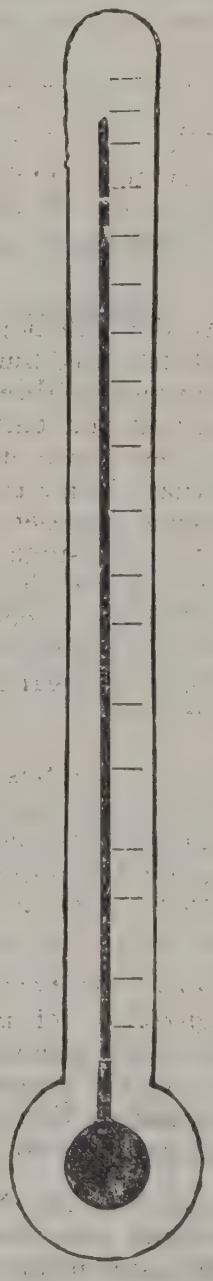
We call attention to the Chairman's letter on Reports of District Associations and hope that we may receive the first reports; and it should be possible for Honorary Secretaries to get their reports sent into this office within ten days, and under instructions the Editor would forward copies to the different papers.

Mr. Graham writes in connection with Mr. Anstead's paper on Ceara Rubber in Coorg, and concludes that it cannot be grown in conjunction with coffee.—a statement with which all coffee planters must agree.

BAROMETER

OF

Labour Department.



	100,000
8-8-14	96,243·78
25-7-14	95·471
11-7-14	95,434·21
4-7-14	94,450·41
27-6-14	90,219·41
20-6-14	89,619·41
13-6-14	88,574·41
6-6-14	86,429·41
30-5-14	84,867·41
23-5-14	82,851·41
2-5-14	82,293·90
25-4-14	79.820
18-4-14	77.958
11-4-14	74,607
4-4-14	73,057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

INFANTILE MORTALITY.

A Serious Indictment of Housing Conditions.

Dr. Angus Macdonald contributed to the recent Imperial Health Conference an important paper on Housing and Town Planning, and the care of child life in Jamaica, which, as he was unable to be present at the meetings, was summarised by Dr. Nicholls. Dr. Macdonald pointed out that the housing of the labouring population is very defective, the small, ill-ventilated and over-crowded huts being responsible for much sickness in those dwelling in them; and, moreover, aiding the spread of tuberculosis and other infectious diseases. Town planning, too, whilst fairly good as regards the larger houses, is very defective where the huts of the people are concerned. The administration of health laws in Jamaica would seem to leave much to be desired. Dr. Macdonald said "Certain items of administration (including the carrying out of the public health laws) are controlled by an elected municipality; whilst certain other items (including the building authority, the sewage system, the water supply) are controlled by a nominated Board. The result is endless confusion, duplicature of expenditure, jealousies, wranglings, and retardation of progress."

The greater part of Dr. Macdonald's paper was taken up with questions concerning the care of child life, and the great mortality amongst the children of the labouring population. Tables which accompanied the paper showed that about 25 per cent., of the children die within a year of their birth; and that a third of the illegitimate children die within the year. It was also stated in the paper that during the past ten years no fewer than 60,000 children had died in Jamaica under one year of age, and Dr. Macdonald was probably conservative in estimating that a third of these deaths might have been prevented. Whilst food is cheap and the climate is excellent for the rearing of healthy children, economic and social conditions are defective. Ill-paid drudgery of the mothers; the necessary neglect by them of domesticity; illegitimacy; and disregard of sanitation are all factors in excessive infant mortality in Jamaica,

Dr. Macdonald advocated the establishment of an Imperial Bureau of Preventive Medicine in order that questions of public health might receive more attention than they do now in the West Indies. And the following extract from his paper shows that the serious question of infant mortality does not appear to be considered by the authorities in Jamaica as ripe for solution.

"Legislation in the form of an 'Infant Life Protection Act' has been recommended, embracing registration of midwives, notification of births, and registration of nurse women; but although a Bill drafted for the purpose has been viewed and blessed by an Archbishop, a Governor, a Colonial Secretary, members of the Legislative Council and others, yet no individual or bureau has felt the time has yet come for such legislation."

In the discussion which followed Dr. Nicholls said that in Dominica and other islands of Lesser Antilles the housing of the poorer people was just about as bad it can be. In many instances the earth served for the floor; the hovels were very small and low; and at night a number of people were often crowded in them, the doors and windows being closed and every crack and cranny stuffed up with rag or paper so that ventilation did not exist. In such a place contagious disease was certain to spread, and he had known instances in which all the inmates had been infected. Town planning did not really exist in Dominica, except partially

in the town of Roseau, people being allowed to build their houses wherever they could, and a similar state of affairs existed in the other islands. The care of child life was as bad, or even worse, in the other West Indian colonies as it was in Jamaica. In Dominica last year the birth rate per thousand was 24·17 and the mortality of infants under one year was 20·78 per cent. of the total.

The causes that led to this loss of human life were many, and chief amongst them was the ignorance of the mothers of sanitation and of the proper way of feeding and caring for their children; neglect of the infants by the necessity of the mothers being compelled to go out to work; illegitimacy; and overcrowding at nights in little hovels, where laws of health were altogether disregarded because unknown. In Dominica the percentage last year of legitimate births in the whole island was only 42·76, and in Roseau, the chief town, it was as low as 20·07. In the official report of the Registrar-General the proportion of deaths of illegitimate children was not given but he, the speaker, knew it to be very high. Gastrointestinal diseases were the actual causes of a large proportion of the deaths of young children, and very many of the cases might be characterised as due to preventible maladies. Farinaceous foods were given to the infants from birth, when the delicate stomachs were unfitted to digest any but the food provided by nature. The infantile dyspepsia thereby set up led to other and graver troubles which in many instances terminated fatally. In all the islands there were Medical Officers who gave free advice and medicines to the children. But preventive measures were required and they were practically non-existent.

To detail measures that appear to him necessary to stop so great a sacrifice of infantile life would take altogether too long, and they would need to be adapted to the varying conditions of the different colonies. There should be a strong Commission of inquiry into the questions surrounding the exessive mortality in the West Indies, and the Commission should be empowered to recommend measures for the amelioration of such a deplorable state of affairs. It could not be said that the blame was due entirely to the West Indian Governments, for England must bear its fair share. There was no public opinion in the West Indies as it was known at home. The Crown Colony system of Government, or a modification of it existed in all the colonies save Barbados; and, therefore, no important measures of Government could be initiated except those that came from, or receive the assent of, the Colonial Office.—*The West India Committee Circular.*

The competition for Labour which Ceylon has to face from the F. M. S. is strikingly evident, writes the *Ceylon Observer*, from the report of the Acting Protector of Labour for the Straits Settlements. The total number of Indian immigrants arriving at Penang in 1913 was 118,581 an increase of 11,655 over the previous year. This is the highest figure on record, beating the previous best by over ten thousand. Over 94,000 were given free passages paid for from the Immigration funds. Some 70,000 Indians left for India during the year, and 80,000 is the figure estimated this year. Two years seem to be about the average duration of stay in the F. M. S. All Tamil coolies now employed throughout the Colony are free and the vast majority of labourers are recruited by licensed kanganies, of which there are nearly 11,000. These figures illustrate the enormous drain on South Indian estate labour, and it is only reasonable to suppose that much of it previously was absorbed by South Indian and Ceylon estates.—*Indian Planters' Gazette and Sporting News.*

BUGS.

Some little known Facts about Bugs.

There is an old saying: A flea fears no bugs. The word *bug* originally meant a ghost or goblin. In this sense it is frequently used by Shakespeare in his plays; and Spenser in "Faerie Queen," Canto xii, writes of, "Bugs to fearen babes." How the word became transferred to insects appears to be unknown. The old meaning survives in "bugbear" and "boggy," but, otherwise, fell into disuse when the word became current as an insect's name. In this entomological sense it will be used here: but it is essential to define its meaning even more closely, for it is a word that is, more often than not, employed in a loose fashion. Among all classes in the United States of America, and to a lesser degree among the uneducated in this country, every insect, and any small creeping animal that looks like an insect, is a bug. Among entomologists the word is often applied to any insect which belongs to the order Hemiptera. It is an order comprising about 20,000 different species of land and water insects. They live by sucking the juices of plants and animals and are provided with suitable mouths for the purpose. The true bugs form a sub-order called Heteroptera, and in this group there is a family, the *Cimicidae*. To this family belongs the bed-bug and some twenty other closely allied insects. The *Cimicidae* form a small group of half-parasitic hemipterous insects widely spread over the surface of the globe. They are of extraordinary interest, but have been little studied by naturalists. The collections in the museums of Europe are generally poor. Yet the reader will observe later on that most of the animals which are attacked by these bugs live in the immediate neighbourhood of man. In the following pages the word bug will be confined to these twenty known species which form this small family.

It will be best to begin with the genus *Cimex*. The human bed-bug is one of the most widely distributed and generally detested insects in the world. *Cimex lectularius* has only lately been suspected of spreading disease: but evidence is now being collected which may show that relapsing fever, Oriental Sore, leprosy and other dreadful maladies may be carried from man to man by bugs. The insect was well known to the Greeks and Romans. Aristotle refers to it as *koris* and Pliny as *cimex*. Linnaeus suspected that it was not a native of Europe, and there are reasons for believing that the insect reached the ancients, with many other accompaniments of civilisation, from the East. There is some evidence that bugs did not reach Germany until the twelfth century, and that they were not introduced into England until somewhere about the year 1500. Thomas Moufet (d. 1604), who was physician to the second Earl of Pembroke and an acute observer of insect life, fixes, with wonderful exactitude, the year when bugs reached London as 1503, and mentions two ladies who, discovering for the first time the bites on their bodies, were terrified by the suspicion that they were plague spots. Other persons, with natural desire to introduce the *Odium theologicum*, charged the Protestant or Huguenot refugees from France with having brought them across the Channel. Though bugs show an aptitude for following man on his migrations there are still outlying spots in North Europe and South America which the common bed-bug has not yet reached. They are nocturnal insects.

Like all other hemipterous insects, bugs have highly developed mouth parts for piercing and sucking. Beneath the head is a proboscis called the rostrum. It is a stoutish grooved beak which, when not in use, can be folded back against the chest, and is composed out of those appendages of the mouth which, in other insects, are known, technically, as the labium and

two labial palpi. Within the groove are two pairs of sharp fine stylets which work to and fro and are, technically, the bug's maxillae and mandibles. All the members of the present family are blood-suckers and, having pierced the skin of their host, blood is drawn up through the groove into the parasite's mouth. The insect's salivary glands are highly developed ; there are three pairs, of which the largest are contained in the abdomen ; ducts conduct the saliva to the mouth. It is an odourless but strongly alkaline and poisonous secretion which flows down the stulets into the wound and causes the blotches and swellings on the victim's skin. It may benefit the blood-sucker by dilating the capillaries and so causing a flow of blood to the spot. The body of a bug like that of all other insects, is composed of a number of segments jointed together. There is a head, with tolerably large compound and faceted eyes at the side, and a pair of slender four-jointed antennae in front. The thorax, which bears the six slender legs, comes next, and behind the waist is a large circular but strangely flattened abdomen which is composed of ten segments, one placed behind the other. This flattened and compressed body is not uncommon among other parasitic insects and serves the bug well; for it is enabled to hide in the cracks of walls, floors, furniture and other secure retreats.

Though possessed of rudimentary wings, which look like little pads on the back of the adult, this insect cannot fly ; nor do its legs, which are slender and all of the same type, enable it to jump. But it may possibly be attracted by the smell of man, and when other means fail it is said sometimes to climb to the ceiling and drop on his bed. In colour, bugs are a ruddy brown and their bodies are more or less plentifully provided with hairs or bristles arranged in definite system and characteristic of the different species. It has lately been pointed out that these bristles of the bug family are of four quite distinct types which are associated with different parts of the insect's bodies. First, there is a plain simple bristle tapering and pointed. Secondly, there is a bristle which also tapers but is abruptly cut off and toothed at the end. Thirdly, there is a relatively thick and cylindrical bristle with distinct ridges at the side and an obtuse apex shaped like a funnel with teeth round the edge. And lastly, there is the fourth type which is curved like a scimitar, the convex side being toothed and the apex wide and blunt.

Any account of the form and anatomy of a bug would be very imperfect if it did not point out a peculiarity which is especially striking among these insects. In the group to which the bed-bug belongs along with about a dozen other species, the body of the male insect is strongly unsymmetrical. The eighth abdominal segment (of the male only) is distorted on to one side and the pair of horny plates (sclerites), which form it, are both unequal as regards their right and left halves. This peculiarity which would require minute knowledge of technical terms to explain in detail, is connected with the organs of reproduction. In the second group, with about half a dozen species, which are all parasitic on bats, the eighth segment of the male is very nearly symmetrical.

The female insect lays her eggs three or four times a year. They are white with a projecting rim round the edge at one end. From ten to fifty may be laid at a time, and they are put in crevices. They hatch in a week or more, and the young bug, though very small and yellowish in colour; is similar in structure to and an almost exact counterpart of its parents. It passes through no perceptible metamorphosis and sucks blood as soon as it can. Whether the larval bug, if it may so be called, can feed on food other than blood appears to be unknown. It moults its skin four or five times

in the course of its growth, and after the last moult the little wing-pads become visible. This is the chief change from larval to mature insect. The whole development to maturity takes about three months. All observers are agreed that the larvae can live for weeks without food. The adults are even more tenacious of life and they bear hunger and cold with equanimity. It is said that they have been found in the bed-hangings of rooms that have been unoccupied for six years. After that long fast it is not surprising to learn that they were as white as paper and terribly thin.

Nomadic tribes are said to be free from the persecutions of bed-bugs. They are insects which love old and solid dwellings, furnished with wooden bedsteads, genuine bits of ancient furniture, curtain tapestry, wall-hangings, and other curios which make bedrooms dirty or, as the bugs think, comfortable. They migrate freely from house to house, in towns, across roofs and along gutters. When they are numerous, houses have been rendered uninhabitable. Modern houses are sometimes invaded in a mysterious fashion and, when they are the houses of the rich, charges of having introduced them are frequently levelled against innocent workmen or harmless bats. It is, however, more than probable that they were imported in the cracks of some priceless piece of antique woodwork, a Jacobean bedstead, a Sheraton wardrobe, or Italian cinque-cinto chest of drawers.

Most members of the bug family are provided with scent glands which secrete a nauseous smelling liquid. It is a colourless fluid, very acid, and contains a volatile oil which floats on water. A drop in one's eye causes violent irritation and tears. The liquid is stored in two minute bladders which open by pores between the insertion of the second and third pairs of legs. When bugs are pinched with tweezers or frightened a small drop exudes and the smell intensifies. It is worse when the insects are stimulated by the increased vitality of summer. The discharge is voluntary and doubtless a protection against many enemies. Yet the bed-bug and others of the family are preyed on by larger bugs which are closely related and in the nature of cannibals. These hunt them down and suck them dry.

Bugs, although so different in general appearance from lice, are related to them. In structure, habits and affinities they are quite distinct from fleas. They both have thirst for man's blood but nothing else in common. The flea is a bold, clean, active dashing cavalier. The bug is a crawling, nocturnal, foul-smelling assassin. The flea has a laterally compressed body, simple eyes, no trace of wings, and passes through complete metamorphosis in the course of its life. In all these respects the bug may be contrasted.

A parasite, so closely resembling our human bed-bug as to be almost indistinguishable, has been found on bats in England. Some entomologists maintain that the same species is parasitic on bats and on mankind; others would distinguish the bat's parasite under the name of *C. vespertilionis*. For the moment the question must remain unsettled. The human bug has been found infesting the nest and houses of domestic fowls and pigeons. Once it has been taken from a dormouse but this must be regarded as chance occurrence.

The species of bug which has been dealt with so far is an insect of world-wide distribution and essentially a follower and parasite of humanity. In the tropics mankind is also exposed to the bites of another species named *C. hemiptera*. This tropical bug is common in dwellings and also turns its attention to domestic fowls. In India it has been found on one of the swallow tribe. On rare occasions it has been discovered among the parasites of tropical bats.

Pigeons have bugs peculiar to themselves, which are sometimes found in vast numbers in pigeon-lofts. *C. columbarius* is a small insect and appears to be confined to the Western side of the old world. It has, so far, only been found in France, Holland and England. It is exceedingly abundant in some parts of France and so voracious that young pigeons are sometimes attacked and left dead from loss of blood. The pigeon-bug of the Eastern side of the old world (*C. peristerae*) is another insect. But like the Western form it is closely allied to the bed-bug and chiefly distinguishable by the size of its eyes, the shape of the antennae and the length of its hairs. It has, so far, only been found at Simla, where it seems to be common in pigeon-houses. It may, later perhaps, be found extending all through India into Central Asia. Eighty specimens were sent home by Mr. Dodsworth in 1911, and they are of a brownish orange colour which, if not due to accident or youth, is very characteristic. Both these parasites have up to the present day only been found in the company of domestic pigeons; and it would be a matter of great interest to ascertain whether the nests of the rock-dove, from which it is believed that all domestic varieties are descended, harbour similar or different forms of these insects. Domestic pigeons often share their lofts with bats and may well have derived their bugs from these fellow lodgers.

Yet there are species of *Cimex* which are essentially parasites of bats. The European bat-bug (*C. pipistrelli*) was discovered and described in 1839 by Jenyns, an English entomologist. It was on the small common bat or *Pipistrelle* that he found it. Later collectors have also obtained specimens on the Noctule and Serotine bats. It has been recorded from bats in England, Holland, Germany, Switzerland, and Russia and appears to be a Western palearctic form. In museum collections it is a rarity, not perhaps because it is actually so scarce but because the parasites of bats are difficult to obtain. The American bat-bug (*C. pilosellus*) is again distinguishable and is generally distributed through Canada and the United States. As its name implies it is an unusually hairy bug.

Three great rarities remain to be mentioned before the list of known species, which belong to the genus *Cimex*, is completed. *C. foeda* is only known from one broken specimen in the Stockholm Museum. In the museum at Budapesth there is a unique specimen (*C. dissimilis*) which was caught on the wall of a house in Hungary. It presumably came from the bats which lived in the roof and, since it is so unfamiliar, it probably does not attack mankind. The third rarity (*C. improvisus*) about whose mode of life nothing has been ascertained up to the present, is known from two specimens in the collections at Vienna and Budapesth respectively. It is a small insect, perhaps the parasite of some small mammal or bird, for both specimens were swept up from the grass in the nets of beetle-collectors.

Most persons are perhaps aware that the nests of house-martins are infested with bugs, but the minute investigation of their habits has not been easy. Those whose houses are favoured by the presence of swallows and martins are generally reluctant to have the birds molested, and there is an almost universal superstition against destroying their nests. In Europe and in North Africa the parasite of the martin (named *Oeciacus hirundinis*) is plentiful; as many as 200 of those insects have been taken from a single nest. Cases are on record where fully fledged young birds have been found so completely robbed of their blood as to be too weak to move. The same bug has occasionally been found on sparrows, the old nests of house martins and holding them against their rightful owners. This bug has once, on the Continent, been found in the nest of the Little Owl. As it is well established

that many raptorial animals take on to themselves the parasites of their prey, one may suppose that the owl had been feeding her brood on swallows. It has also, occasionally, been taken from the nests of sand-martins, and, as these members of the swallow tribe breed in deep burrows far from houses it is difficult to conjecture how the bug got there. It may have been transferred to the sand-martins at the season of migration when the swallow tribes flock together. The same insect is abundant in the nests of the swifts which breed in the tower of Strassburg Cathedral. It has, on a few occasions, been found clinging to birds which were killed on migration. The majority, however, remain behind in the deserted martin's nests where they may be found in late September in all stages of development. Early in April they are still there but thin, hungry and expectant. Months of cold and famine have been endured with surprising fortitude ; but the return of their warm-hearted feathered hosts must be very welcome. The reader may wonder why insect-eating birds should tolerate these pests, which must trouble them horribly. Perhaps the nauseous scent glands act as a protection. This insect is a bird- parasite of the Old World only. Another species (*O. E. vicarius*) is found in the nests of swallows or martins in North America. Under the bark of trees in Chili a peculiar bug (*Bertilia valdiviana*) has been found. Very little is known of its habits though it was described as long ago as 1865.

We pass now to a very peculiar and interesting group or sub-family of bugs which are found on bats in tropical countries. Several of them have only quite recently been discovered. One of the strangest points about certain members of the group is the structure of their legs. As every one knows, the legs of an insect consist of a number of jointed segments. The horny outside which forms an external skeleton contains the muscles which move the legs. In a typical insect the segments which compose the leg (excluding the small tarsal joints in the foot) are four in number. The last of these, nearest the foot, which is named the *tibia*, is usually comparatively long and slender. It may be roughly compared to our shin-bone. Now in some of these tropical bat-bugs there is a pseudo-joint in the *tibia*, the effect of which is to give more flexibility to the leg without introducing an extra articulation. In these insects we find a type of bug most highly specialised for a parasitic life, and they are as a rule taken from the bodies of the bats. In the genus *Cacodmus* there is no pseudo-joint in any of the *tibiae*. In the genus Aphrania there is a pseudo-tibiae of the middle pair of legs. Lastly, in the genus *Loxaspis* we find the last stage of development with pseudo-joints in all three pairs of legs. These half-articulations are unknown among insects with the exceptions of two groups (*Polyctenidae* and *Nycteribidae*), and both of these are composed of the parasites of bats. The former are hemipterous insects remotely related to bugs. The latter are wingless flies belonging to a totally different order of insects. They cling with spider-like legs to the bat's fur. The pseudo-jointed leg is therefore an instance of an adaptation separately evolved in three separate groups of insects which lead similar lives.

One of these rare bat-bugs (*Cacodmus villosus*) is found in Natal, the Transvaal and Nyassaland. A second (*C. ignotus*) also probably African, closely allied to it but densely covered with rather long hairs, is an enormous insect twelve millimetres long. The only known specimen was found on a bat preserved in a jar of spirits in the Natural History Museum. A third (*C. indicus*) is found on Indian bats. From Basutoland another insect (*Aphrania barys*), about which little is known, has been brought back. In the Sudan and Uganda bats are infested with a dark brown bug (*Lox-*

aspis mirandus) of which the first examples were taken in 1911, from a house bear Mombassa, by Mr. Jackson, Governor of Uganda. From the bat caves of Java comes another bug (*L. seminitens*). Lastly to complete the catalogue of known species there is an American bug (*Haematosiphon inodora*) which occupies an isolated place in a sub-family and genus by itself. It has a very long rostrum, enters human dwellings, but for the most part is a parasite of fowls. Its range extends from the Southern United States to Mexico and the Central American Republics. Since the domestic fowl is a bird that was introduced into the New World it cannot be the original host, and there is great likelihood that the imported domestic fowls received their parasite from the native bats.

This brings us to the consideration of two problems. First, since all parasites are clearly descended from non-parasitic ancestors, how did bugs develop their parasitic habits? Secondly, what animals were their first hosts? As to the first, one can almost see allied insects in a state of transition. They are normally feeders on vegetable juice but only need the opportunity to become suckers of animal blood. In an allied family there is a field-bug (*Lyctocoris campestris*) which is often found under the stacks in the cornfields of the Continent. With the straw it gets carried accidentally into barns and stables. Here amid changed surroundings, it bites and sucks the blood of horses and cows. It has penetrated into the dwellings of man. Where straw is used as thatch it has been found in the nests of the swallow family. As to the second question the reader cannot have failed to notice the obvious connection that exists between the *Cimicidae* and bats. Out of the twenty species in the family twelve are essentially bat-parasites. Bats are their true hosts, and of the remaining eight, several more have occasionally been found on bats. In many parts of the world bats are found in neglected attics and under the roofs of human dwellings. Here they are brought into proximity, not only with mankind, but with pigeons in pigeon-lofts and swallows which nest under the eaves. The inference is almost irresistible that all the members of this noteworthy family of insects were originally parasites of bats.—HAROLD RUSSELL.—*The National Review.*

A SUPPLEMENTARY "Ceylon Blue Book for 1912" has just come to hand from which we have gained the following information, which may prove useful to those interested in "Ceylon's Future":—

ACREAGE UNDER TEA.

Province.	1912. Acres.	1911. Acres.
Western	21,884	21,385
Central	275,244	286,685
Northern	...	...
Southern	20,187	20,014
Eastern	...	...
North-Western	957	1,005
North-Central	...	...
Uva	69,800	69,794
Sabaragamuwa	69,553	58,394
Total ...	457,625	457,277

—*Indian Planters' Gazette.*

RUBBER.

Rubber Promise and Performance.

During the course of the three years which have elapsed since the last International Rubber Exhibition at the Royal Agricultural Hall at Islington, the position of the rubber industry has undergone no very startling changes, but it has become possible to estimate with greater accuracy the effect upon the trade of the introduction of cultivated rubber upon a vast and steadily increasing scale. If we turn to the prospectus of any typical rubber company in the early part of 1910, when promoters were so busily engaged in attracting the attention of the investing public to estates "admirably adapted to the growth of rubber" in every part of the Malay Peninsula, we invariably find that, with the area already planted, and about to be planted in future years, the annual produce of the raw material is shown in a steadily ascending scale, while the prices are set forth in an inverse ratio, which generally drops to about 2*s*. 6*d*. per lb. at the end of a long term of years. No attempt was made in those piping times to explain how the enormous increase in rubber, shown in the forecast, was to be disposed of; it seemd sufficient to allow for this matter in the fall in price. Thus we find on one estate the rubber valued in 1911 at 6s. 6*d*. per lb., in 1912 at 5*s*. 6*d*., in 1913 at 4*s*. 6*d*. and thereafter dropping steadily by 6*d*. per annum to 3*s*. 6*d*. per lb., by which time the weight of rubber harvested was to be 30 times that grown in 1911. In this particular instance it seemed impossible to imagine rubber at anything less than 3*s*. 6*d*. per lb., out of which the cost of collecting and marketing was taken at 1*s*. 6*d*. per lb. (a very usual amount in those days) leaving a net revenue of 2*s*. per lb. to the fortunate planter. No wonder that the promise of 80 per cent. per annum at these prices proved a tempting bait to the public at large, and that the coffers of the promoters were filled to overflowing.

For some reason or other as we have shown on previous occasions, the manufacturer did not at first take kindly to the cultivated rubber, as he failed to find in it certain of the qualities to which he was accustomed in the wild products from the Amazon, and consequently "fine Para" still continued to maintain the pride of place, shown in a value of nearly a shilling a pound more than the best qualities of rubber from the Straits Settlements and Ceylon. As more and more of cultivated rubber came on the market, values declined, until the minimum price of the prospectus of 2*s*. 6*d*. per lb. was reached many years before the maximum output of that flattering estimate was reached. Thereupon rubber producers began about a year ago to consider seriously how it might be possible to obtain better prices and to prove to the manufacturer that it was all a matter of old fashioned prejudice to prefer Para to plantation, and to seek how it might be possible to induce him to give, if anything, more for "smoked sheet" and "pale crepe" than for the highly-prized, wild rubber from South America. There can be no possible doubt that the serious decline in the price of rubber has been a blessing in disguise to many of the producers, and that the effect of this decline has been to bring about certain much-needed economies on the rubber estate. As was shown by a correspondent on June 16, in lieu of the former estimate for collecting and marketing of 1*s*. 6*d*. a lb., it seems possible on a well-managed property to reduce the "all in" cost to 8. 76*d*. per lb., and on some large plantations recent figures tend to confirm this forecast. There is no doubt that during the boom period, land was bought at excessive prices, and that far too high a value was often placed on immature trees, planted more closely than was advisable. Practical experience has shown that a spacing 20 x 20—that is approximately 100 trees to the acre—is the best for a high yield, and the planting on some of the older estates is far too crowded. In circumstances such as

these it may not be possible to bring down the cost to the above figure, but it is quite reasonable to expect that an outlay of 1s. on the cost of production and marketing will yield a very good profit on rubber sold at 2s. per lb., and that prices may fall further without reducing the grower to his last trenches. The keynote of the present exhibition is the search for further uses of rubber, and in this direction manufacturers and others will do well to bestir themselves. Rubber roads and rubber floors, rubber playgrounds for our school children, and even rubber walks in our gardens need not be far distant, and if cheap rubber will bring us these luxuries no steps should be left unturned to direct public attention to such possibilities.—*The Times.*

Fertilisers in Hoticulture.

The cultivation of vegetables and flowers, which require on the part of the growers continual care and study, has not derived so much benefit as it should from the regular employment of modern fertilisers, and yet it is just this kind of intensive cultivation, in which the soil gets no rest, that could get most profit from the scientific use of concentrated plant foods. The crops of vegetables and flowers, following in quick snccession, drain the soil of its nutritive principles, nitrogen, phosphate and potash. The fertility of the soil is usually maintained by applications of stable manure, but this kind of manure is getting dearer and dearer every year, and its composition is not ideal for the purpose, as it does not contain sufficient phosphate in proportion to its nitrogen and potash. A ton of such manure contains about 11 lb. of nitrogen, 10 lb. of potash, and only 6 lb. of phosphoric acid, so that to supply the soil with a sufficiency of the latter ingredient it is necessary to apply a large dressing yielding more expensive nitrogen and potash than is required.

In field practice with farm crops the case is somewhat different, because crops are grown in a rotation system, by which the special requirements of the crops for different kinds of plant food is utilised and what one crop does not want, the following crop has a particular need for; but in horticulture the demands of the plants is incessant for all the plant foods throughout the year.

We would not suggest that the value of stable manure should be disregarded; it should form the basis of the system, but its use can be restricted with advantage, and supplemented by the addition of fertilisers which contain in a concentrated form the principal plant foods, and possess the advantage of being easy to handle, enabling the grower to apply just the respective amounts of available nitrogen, phosphate, and potash that will lead to the best results.

The grower, who makes a careful study of his business and avails himself of the discoveries of chemical science, knows pretty well how much of each plant food is required by the particular kind of plant he is cultivating. Should the plants look feeble, with leaves of a yellow tinge, he knows how to stimulate the growth, and he is also aware that in order to get good blooms, and choice fruit, the plant must have a sufficient supply of phosphate and potash, obtained so conveniently in the forms of superphosphate or basic slag and potash salts.

Peruvian guano is an ideal fertiliser for garden uses, being concentrated in form and containing all the requisite plant foods.

It may be added, that while the enterprising gardener will not fail to make use of fertilisers, he should also be careful to limit their employment to the needs of the case. A common fault is to apply quantities unnecessarily large, involving waste and sometimes doing more harm than good.—*Mark Lane Express Agricultural Journal.*

CORRESPONDENCE.

Cathcart House,
Palace Road,
Bangalore,
3rd August, 1914.

Reports of District Associations.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—The last two or three issues of the 'Chronicle' have reported proceedings of various Association meetings which one has turned up hoping to find something of interest on the Labour Department or Scientific Officer Scheme.

It is rather disappointing therefore to find that these proceedings all refer to meetings held before the General meeting of the U.P.A.S.I. some of them close on 2 months ago.

The Honorary Secretaryship of local Associations is, I know, often a very thankless job but I think the minutes of meetings might be sent on quicker than they are at present. A week at the utmost should be ample time to get them out and the *Chronicle* and the Madras papers should get copies sent direct.

I hope this matter will have the attention of Honorary Secretaries.

Yours faithfully,
J. A. RICHARDSON,
Chairman U.P.A.S.I.

Hallery, Mercara P. & T. O.,
N. Coorg,
July 24th, 1914.

Ceara Rubber in Coorg.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—The report of Mr. Anstead's paper read at the International Congress of Tropical Agriculture in London, came rather as a shock to me. For a long time I have been trying to persuade the Powers that be in Coorg that our Ceara Rubber is a failure, and they have now given us a substantial remission of Assessment on land planted with Ceara. I now hear from Mr. Anstead's paper, somewhat glowing accounts of the prospects of Ceara " especially in conjunction with coffee."

He also states that it needs Good soil and cultivation and that it has been proved useless as shade for coffee.

From this it would seem that it must be planted quite apart from coffee. Any planter with experience of the damage done to Coffee by the proximity of Ceara will agree.

Again, the months during which it is sometimes possible to tap Ceara in Coorg, coincide with those during which the most important works are in progress on coffee estates.

In conclusion, although there may be some planters in Coorg who believe in the possibility of making money out of Ceara, I feel sure there are none who think it can be done "in conjunction with Coffee."

Yours faithfully,

JOHN A. GRAHAM.

Canterbury, Kent,
20—7—14.

Kalai Syndicate Experiment.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Deat Sir,—I have just seen Mr. Anstead's letter in reply to mine *re* Kalai Syndicate experiments.

Mr. Anstead tells us his department has had these experiments under consideration for two years and deplores my ignorance.

Is it too much to ask Mr. Anstead to differentiate between the experiments as a whole and the part I alluded to, undertaken by Mr. Frattini during a hurried visit of which I and others knew nothing.

After this visit Mr. Frattini made a statement that there were only two men in N. Mysore willing to co-operate—or words to that effect. Well, in saying this he said what is not true.

C. S. CRAWFORD.

The "World," writing on the subject of "The Empire's Tea,' says:—"There is little doubt that the most generally appreciated tea in the British Isles comes from India. During twelve months nearly two hundred million pounds' weight of Indian tea passed through the bonded warehouses. Imagine 87,000 tons of tea of all kinds, from the delicate Muscat flavoured Darjeelings to the plain substantial Cachars and Sylhets. Picture the long procession of tea chests which go to make up this amount, and think of the number of people who have assisted to place the tea in London. What a sensation would be caused in London's streets if there were arranged a procession of all these picturesque Orientals whose labours enable us to sip our cups of tea in the comfort of our own firesides.

The procession might be headed by the thousands of Lascars (Indian seamen) and Seedees (African firemen) who are employed on the ships taking out tea machinery and empty chests and bringing back the 1,690,000 chests full of tea which are annually consumed in the United Kingdom. Then would follow a vast crowd of Nagas, Sonthals, Badegas and other primitive Indian peoples who assist in the clearing of the primeval forests among which the gardens are situated.—*Indian Planters' Gazette.*

The Planters' Chronicle.

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(INCORPORATED)

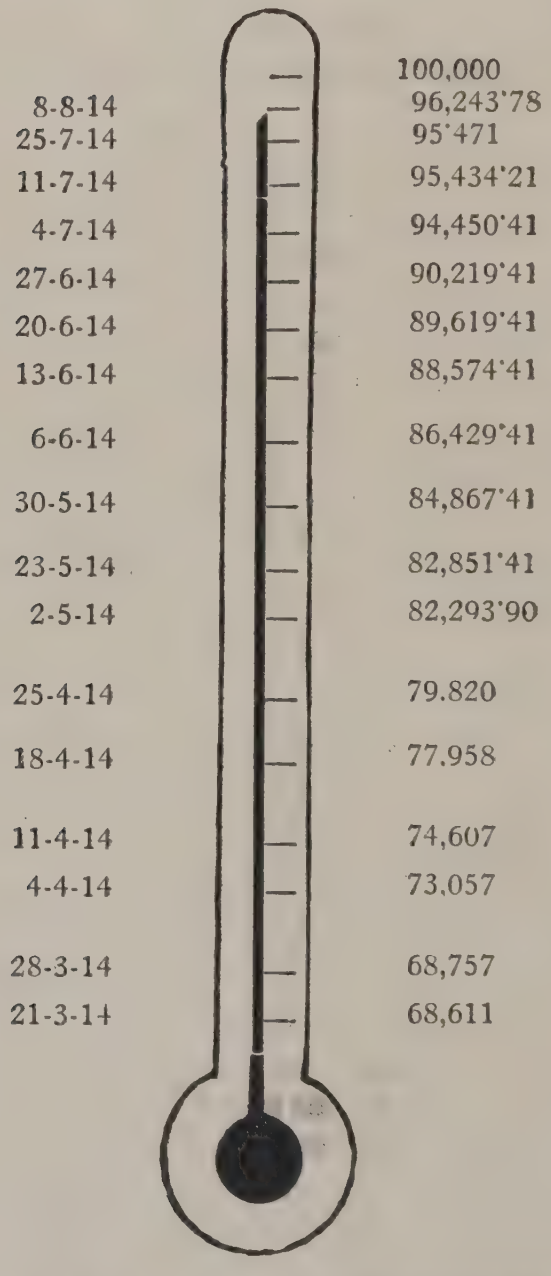
Contents.

The Labour Barometer shows no change since last week, nor need we expect any great rise until affairs are more settled. The air is full of rumours, and it is difficult to sift the grain from the chaff, and we have thought it best to pin our belief and trust in Reuter's news, which is at all events another tie and can be relied on. It is almost a pity that the newspapers should be allowed at this juncture to publish anything that has not passed the censorsnip. All know how censorship of plays emanating from the Lord Chamberlain's Office were attacked and condemned; and rightly so, as an Englishman dislikes anything that tampers with his liberty of thought and action; but the censorship of War news should be applauded and the more strict it is the better for all as the duty properly performed will prevent the diffusion of false news and rumours calculated to do lasting harm. A false rumour once set afloat is like a scandal, very hard to overtake and refute. Some people are so built that they prefer the rumour to the refutation. We ourselves have absolutely no shadow of doubt as to the final result of this war. England and her allies, forced into it, are bound in the end to come out on top and without any jingoism on our part. It is the best thing within our memory that has occurred. The War was bound to come. Better now than three years hence. England and the Empire enter into it absolutely united and with absolutely clean hands. The end of this war sees the end of militarism on the Continent. It will see the end of huge armaments and intolerable taxation to foster the egregious pride of one proud man, who wears the garb but not the clothing of the great Napoleon. The shooting of the Socialist leader by Germany is worse than a crime—it is a blunder of the most far reaching consequences. All trade and oil commerce have been disturbed by this War, and we recommend perfect trust and quietness as it only requires time to right the present position financially. Our Chairman is doing all that is possible to arrange with the Madras Banks to assist planters in their temporary difficulties.

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

Central Travancore Planters' Association.

The Second Quarterly General Meeting of this Association was held on Saturday, July 25th, at 10 a. m. at Twyford Bungalow.

PRESENT.—Messrs. H. C. Westaway (Chairman), W. H. G. Leahy (Vice-Chairman), T. C. Forbes, J. S. Wilkie, J. H. Ellis, F. W. Winterbotham, W. H. J. Milner, A. R. St. George, R. L. Goldsmith, R. D. Scoble Hodgins, and R. P. Roissier (Honorary Secretary). *Visitor*: W. E. Forbes.

The Notice calling the meeting was read.

The Proceedings of the last meeting were taken as read and confirmed.

CORRESPONDENCE.—Read letter from the Honorary Secretary, Mundakayam P. A., dated 7th April. Read letters from the Honorary Secretaries of Associations in S. India *re.* Lady Ampthill Nursing Institute. Read letter from Mr. C. S. Prince, dated 4th June. Read letter from the Honorary Secretary, West Coast P. A., dated 23rd June. Read letter from H. R. Haigh, Esq., dated 20th July. Read letters from the Resident in Travancore, dated 24th and 28th April. Read letters from Messrs. Aspinwall and Co., Ltd., dated 14th and 25th May. Read notice of 1st July sent by F. G. Warne-Richardson, Esq. Read letter from T. C. Forbes, Esq., dated 13th July. Read letters from the Honorary Secretary, Peermade Road Committee, dated 19th and 20th July.

ROADS.—It was resolved that all matters dealing with District roads are in the hands of the Honorary Secretary, Road Committee, and matters dealing with the Government Roads be dealt with by the Honorary Secretary of this Association.

BANGALORE DELEGATE'S REPORT.—As Mr. Richardson was unable to be present the report was read by the Honorary Secretary as follows :—

"Gentlemen,—I attended the meeting of the United Planters' Association of Southern India as your Delegate and in the absence of any special instructions my task was a particularly light one.

The meeting opened on Monday the 6th with the reading of the Secretary's report and the Chairman's address both of which have appeared in the *Chronicle*.

The most important items on the agenda as far as we were concerned were the Labour and Scientific departments.

The first afternoon was taken up with discussion on the Labour Department which came into existence on the 1st of July.

Mr. Cook, of South Travancore, opened the debate and from the point of his Association was quite open-minded on the subject but drew attention to the fact that the constitution of the Committee did not meet with general approval and he thought was keeping a good many from coming in.

Mr. Waddington in speaking for his co-delegate Mr. Mead (who was unfortunately unable to be present) laid some stress on the same point.

Mr. Pinches on behalf of Messrs. James Finlay & Co. waived their right to Mr. Martin's voting for the 6th member.

Mr. Kirk then brought forward the contingency of a Chairman from amongst Messrs. James Finlay's men being appointed and thus giving them a controlling power on the Labour Department Committee and it was pointed out to him that this lay entirely in the hands of the U. P. A. S. I.

Mr. Pinches explained the position of his Firm in connection with the Labour Department which I think cleared up a lot of doubts and misunderstanding.

I then asked Mr. Pinches whether in the event of Mr. Barber's resigning he would agree to his place being filled by the U. P. A. S. I. Mr. Pinches replied that he thought he could agree to this but could not commit Messrs. James Finlay & Co. to any such agreement but would recommend them to do so.

Mr. Waddington pointed out that Messrs. James Finlay & Co., had made no stipulation with regard to filling Mr. Barber's place should it become vacant and he thought it was a matter for the U. P. A. S. I. to settle for themselves. After some discussion it was decided to let the matter drop.

The question of subscription by Estates joining the Department after it was started was discussed and a resolution as follows was passed :—' That any Estate joining the Department twelve months after the starting of the Labour Department shall pay an entrance fee of Re.1 over and above the Rs. 2 per acre per year for the first year of joining, but that any new interest or Estate changing hands not having had the chance of joining previously shall be allowed to join on original terms.'

I think you will agree with me that this is a most fair and just arrangement. At this stage of the proceedings a Sub-Committee was appointed to report on further details of the scheme.

The report of the Sub-Committee came up for consideration on the third day and they made the following recommendations :—

1. That the executive duties of the department shall be conducted by the Committee appointed.

2. That in the event of a vacancy occurring on the Committee, such vacancy, with the exception of the two representatives of Messrs. James Finlay and Company, shall be filled by election by the Council of the United Planters' Association of Southern India.

3. That any resolution or regulation as regards the Labour Department must be confirmed or revised at the next annual meeting of the United Association.

4. That the funds be paid as realised into a separate account with the Mercantile Bank of India and shall be available by cheques signed by the Chairman and Secretary of the United Planters' Association of Southern India, the accounts to be audited annually.

5. That the Executive Committee shall place the matter of subscriptions and guarantees on a business basis as early as possible.

6. That pending the return of Mr. Aylmer Martin to India the Secretary of the United Planters' Association of Southern India shall collect as they fall due the instalments directly from subscribers, and any expenses incurred on account of clerical work, postages, etc., be met from the Labour Department Funds.

7. That the Chairman of the United Planters' Association of Southern India be authorised to advance any necessary funds for the immediate expenses of the Labour Department.

8. Messrs. James Finlay and Co., and Mr. J. A. Richardson will continue running their departments till the return of Mr. Aylmer Martin and the cost from 1st July, 1914 to date of settlement will then be adjusted.

9. New areas opened shall be liable to subscribe from the beginning of the Labour Department year, the 1st of July of the calendar year in which they are planted.

These draft rules were considered at length and item by item in Committee.

Coming back into open meeting Mr. Congreve proposed and Mr. Nicolls seconded, that the recommendations of the Sub-Committee be adopted.

No. 1. Calls for no special comment.

No. 2. Is a most important ruling and should allay the fears of many of the waverers.

No. 3. Is also a wise precautionary measure.

No. 4. Deals with the funds of the Department.

No. 5. Is a matter that will have the Committee's immediate attention.

No. 6. Deals with the management pending Mr. Martin's arrival.

No. 7. Deals with the financial requirements.

No. 8. Refers to Messrs. James Finlay's and our own Agencies and I think is the simplest arrangement.

No. 9. Is an important ruling and I am not sure that all our estates have included this year's clearings and I would ask our Honorary Secretary to revise the acreages in our District and send in his returns as soon as possible to the U. P. A. S. I.

The above recommendations were unanimously carried by the meeting.

The question of filling Mr. Barber's place during his temporary absence was fully discussed both in and out of the meeting with the result that Mr. Abbott was unanimously appointed to act for him.

The question of the 6th member then lay with Mr. Abbott and the Chairman who as it came about was myself.

Now, Gentlemen, I think no one can say the Committee is a packed one in any way and so I hope this objection which has been one of the strongest to the scheme has disappeared.

To begin with Mr. Martin was our own choice as also Mr. Abbott who has been appointed to take Mr. Barber's place and I have not the slightest hesitation in saying Mr. Barber would most certainly have been appointed by the meeting had it been a matter of voting.

Mr. Browne who has been asked to become the 6th member was the choice of the meeting and lastly myself as the Chairman of the U. P. A. for the coming year.

I now trust Gentlemen we have buried that bogie and the only grievance we have at present is that of cost.

With those who consider they have plenty of labour and are not justified in spending their Companies' or Proprietors' money in this way I have every sympathy though in some cases I think it is short-sighted policy.

We have however made just and equitable terms for them to come in later but I hope many will come in straight away and help to make the U. P. A. S. I. Labour Department an unqualified success. Let us show our neighbours elsewhere that we have at last realised that 'Unity is Strength.'

WEIGHTS AND MEASURES.—I proposed that the resolution passed at the U. P. A. meeting last year be re-affirmed.

Railways, Prevention of Rubber Thefts, Adulteration of Coffee, were all items in which we were not interested.

PLANTERS' BENEVOLENT FUND.—Some alterations to the rules were suggested by Mr. Abbott which were passed.

I do not think this fund gets the attention it deserves and cannot too strongly impress on all planters to support the fund.

I know that in most cases it is forgetfulness more than anything else which has kept many out of the subscription list. There is no knowing when a little temporary help might be necessary to any of us and subscribers to the fund are entitled to it and need have no hesitation in asking for it.

I hope every member of this Association who has not already joined will do so.

Railway Freight on Tea Seed.—A resolution was proposed by Mr. Nicolls and seconded by Mr. Congreve. 'That this Association approach the Railway Companies asking them to take more care over the transport of tea seed to insure prompt delivery at the correct destination and that the various railways be asked to reconsider their refusal to reduce the freight on tea seed as they have already made a considerable reduction on through freight of tea to Madras.'

PESTS, DISEASES AND PESTS ACT.—This matter was taken up by Mr. Brock at considerable length and was strongly supported by Coffee planters on account of green bug which is very prevalent in some coffee districts at present.

We are also interested in this matter on account of Helopeltis which has shown up in our tea. After some discussion the following resolution was proposed by Mr. Brock and seconded by Mr. Congreve: 'That this Association ask the Government of Madras to legislate for the local control of pests and diseases in the planting districts of Southern India and approach the Governments of Mysore, Coorg, Travancore and Cochin with a view to asking them to undertake similar legislation.'

Dr. Leslie Coleman (Director of Agriculture, Mysore) gave a very interesting account of the treatment of green bug and expressed himself strongly in favour of a Pest Act. This is a matter of great importance to us in Travancore and one which calls for combined action of all Travancore Associations both tea and rubber.

THE SCIENTIFIC DEPARTMENT.—This is a matter of vital importance to the whole planting industry and one which calls for your immediate attention.

Things have reached a stage now when we must have a Mycologist to complete the department. We must have an experimental station to carry out experiments both of which cost money and in the face of the heavy calls that have been made on local Associations it is felt we cannot look for much more money from this source.

At the extraordinary meeting of the U. P. A. held in March last we put our case before Mr. Chadwick, the Director of Agriculture, Madras, and he placed our views before the Madras Government with the result that Government has made us a definite offer to run the whole Department for us at a cost to the U. P. A. of Rs. 15,000 per year.

For this we would have our Scientific Officer Mr. Anstead and a Mycologist at our disposal and an experimental station.

It is I think a generous offer when it is considered that beyond the capital expenditure the Madras Government is willing to spend about £2,000 a year on our behalf.

At present the U. P. A. including the subscriptions from the Native States subscribe Rs.9,000 leaving Rs.6,000 more to be raised.

The Travancore Government as you know discontinued their yearly subscription at the end of the first period of 5 years.

Considering the large Revenue derived by the Travancore Government from the planting industry in the State I think we should again approach the Dewan on the matter and ask him to reconsider their decision.

As regards the position of the experimental farm I proposed the Anamalais as being a most suitable centre. It is within easy reach of Coimbatore by car where there is a large Government laboratory and library which would be at the Scientist's disposal.

Coimbatore is within easy reach of Cochin and its planting districts and from there the Travancore Rubber and Tea districts are easily accessible.

The financial position is that we require to raise another Rs. 6,000 per year of which Rs. 1,800 annually was promised to the meeting.

The Anamalai Association made a very sporting offer of 30 acres of land which they agreed to fell and clear for the experimental farm.

The following resolution was passed by the meeting:—'That this Association thanks the Government for the interest they have shown in the Scientific Department of the U. P. A. S. I. as expressed in G. O., No. 901 dated 1st July 1914.'

Another resolution was passed with reference to approaching the Travancore Government for help reading as follows:—'That the U. P. A. S. I. do again approach the Government of Travancore with the programme of the Scientific Officer Fund and point out to them the vital necessity to the planting community of an efficient Scientific Department. The Planting Industry represents a large interest in Travancore and in view of this we would ask the Travancore Government to reconsider their decision not to subscribe to the Scientific Officer Fund.'

In this matter our local Associations can back up the U. P. A. by pointing out the absolute necessity of scientific help for the welfare of our industry.

This, Gentlemen, closed the business of the meeting with the exception of the election of Office-bearers which resulted as follows:—

Chairman	...J. A. Richardson	...Central Travancore.
1st Vice Chairman	...J. A. Graham	...Coorg.
2nd do.	...C. H. Brock	...Nilgiris.

I am sorry I am not able to be present and place my report before you personally but should I have left out anything I shall be glad to give you any further information in my power.

ELECTION OF NEW MEMBER.—Messrs. Aspinwall & Co., Ltd., having applied for membership of this Association it was proposed by Mr. Westaway "That Messrs. Aspinwall & Co., be elected a member of this Association, as a firm, at an annual maximum subscription of Rs.25 and this

entitling them to one vote only which can be used on all matters except those dealing with the Taxation of Land."

Seconded by Mr. Roissier.—Carried unanimously.

RESOLUTION.—Mr. Forbes again brought up his resolution which at the Annual Meeting had been postponed for six months. With the consent of the seconder the date was altered in the resolution, from the 1st May to the 1st August. The resolution therefore put forward was as follows :—

"That the rate of pay for men be raised to six annas from the 1st August, 1914." Seconded by Mr. Hodgins.

After a lengthy discussion on this resolution an amendment was proposed by Mr. Leahy and seconded by Mr. Westaway. The Amendment "That the pay for men in the field be six annas as from the 1st August, 1914. and that no increase be made in Check Roll but the men may earn overtime in the field."

After a further discussion the Chairman put the Amendment to the vote and afterwards the resolution. The Amendment was carried.

VOTING.—In favour of the Amendment ... 6

In favour of the Resolution ... 4

RESOLUTION.—Mr. Leahy proposed "That owing to the serious increase in the thefts of Tea from factories, etc., His Highness Government be asked to introduce a Tea Theft Act including a compulsory licence for all tea vendors."

Mr. Leahy withdrew his resolution and agreed that the matter be first referred to the Superintendent of Police, Travancore, for his remarks and suggestions.

RESOLUTION.—Mr. Milner proposed "That all estates concerned be asked to furnish the Honorary Secretary with figures showing their acreages as revised by the recent re-survey with a view to approaching Government regarding a re-adjustment of previous land taxation on the basis of such figures."

Mr. Milner withdrew his resolution as this matter had been settled previous to the meeting.

RESOLUTION.—Mr. Hodgins proposed "That in buying and selling of bandies between Kanganies of different Estates all payments for such shall be made through the Superintendents and that any Superintendent shall have the right of requesting that a Bandy shall not be bought or sold by or to his men should he consider it advisable to do so."

This resolution was not seconded.

Mr. Scoble Hodgins then brought to the notice of the meeting the scarcity of silver change at the local Treasury.

The Honorary Secretary was instructed to write to the Superintendent, Devicolam Division, on this subject.

This completed the business of the day.

The Chairman thanked Mr. Forbes for his hospitality in putting his Bungalow at the disposal of the Meeting.

Mr. Leahy proposed and Mr. Ellis seconded a hearty vote of thanks to the Chair and to the Honorary Secretary.

The Meeting then terminated.

(Signed) REGINALD P. ROISSIER,
Honorary Secretary.

THE WAR.

The Strategical Position.

The Military Correspondent of the *Morning Post* wrote as follows on the 15th May :—

For some years past it has been becoming apparent that in the event of another Franco-German War the German General Staff have it in mind to turn the formidable defensive lines which protect the French frontier between Verdun and the Swiss border by moving a portion of their fighting forces through neutral territory. Looking at the matter from the purely Military point of view and leaving all questions of International guarantees out of account, the decision to make preparations for such a plan of campaign is creditable to the foresight of the Military Authorities in Berlin. Experiences in recent campaigns indicate that fortifications, even when they are not of the most formidable type, cannot readily be rushed—that was proved at Port Arthur and has since been shown at Adrianople, Janina, and Chatalja —and in the warfare of the present day it is all important to gain the upper hand from the start. For many years after the French had taken their lines of defence between Verdun and Toul and between Epinal and Belfort in hand, German military thinkers were inclined to assume that these fortifications would not, in the event of war, prove sufficient obstacles to compel invading hosts coming from the east to find their way through the gaps purposely left by General de Riviere. But the lessons of the war in the Far East, coupled with the fact that the defences have been somewhat strengthened at important points, have obliged the Germans to realise that for practical purposes advances in force can only be carried out through the gaps.

The French Defences.

These gaps, lie respectively between Verdun and the Belgian frontier and between Toul and Epinal, and each had a width of about 40 miles as General de Riviere originally designed the lines. Verdun, Toul, Epinal and Belfort are all four formidable entrenched camps, acting as pivots—it is convenient to distinguish the place of arms, where a girdle of detached works includes a considerable area, as an "entrenched camp." The routes through the northern gap lead in the first instance into the somewhat rugged and inhospitable Argonne country, and (counting Luxemburg as neutral territory) the approaches from the German side are narrow for the employment of great Armies. The gap between Toul and Epinal, on the other hand, serves as a gateway into the upper basins of the Meuse, the Marne, and the Seine, a fertile region. eminently adapted for military operations conducted by great masses of men, and the great lines of railway communication leading from the interior of Germany converge upon the Franco-German frontier opposite to this gap, and are calculated to ensure the concentration of a vast army within a very few days of the commencement of hostilities, ready to advance. The French have, however, somewhat extended the line of works on the Toul side, there is an awkward fort in an important position close to Luneville, and the consequence is that this gap cannot any longer be looked upon as so much as 40 miles wide. Of late years, moreover the fighting strength of both the German and the French Military Forces has appreciably increased, and the consequence is that spaces which a quarter of a century ago afforded a reasonable amount of elbow room for the hosts which would then have been likely to confront each other no longer afford sufficient elbow room now. Neutral territory renders the approaches to the northern gap inconvenient from the German point of view, the southern gap has been rendered narrower than it was at the outset, the expansion of the Armies

concerned has tended to make both gaps too restricted for the work of invasion if Germany's huge Army is to be made full use of from the outset, and the way out of the difficulty obviously is to turn the lines of defence either to the north or to the south by traversing Luxemburg, and Belgian territory in the one case, or Swiss territory in the other case.

Before going further it may, however, be useful to give some details concerning the French fortifications. Owing to the character of the ground, the line Epinal-Belfort is held to be very secure; and Belfort is so close to the Swiss frontier that there is for practical purposes no gap at that end. But the section Verdun-Toul is not regarded as equally satisfactory and impassable. Along the greater part of the way there is a well-defined plateau varying between three and eight miles in width, immediately on the right bank of the Meuse; the forts are constructed on this high ground, but for the most part they overlook the river valley and do not therefore bear eastwards over the approaches from German territory on to the plateau. An enemy coming from the side of Metz can in fact easily get on to the plateau without coming under fire of the works, and some of the works are, moreover, commanded at inconveniently close range from higher portions of the plateau. It has been proposed to set up a chain of unpretentious works along its eastern edge, but nothing would seem yet to have been decided or carried out. Still, even admitting that this section is not all that might be wished, it seems questionable whether by a sudden advance, coupled with resolute offensive operations, the Germans could make themselves master of two or three of the forts and could thus create a gap, through which they would gain the Meuse between Verdun and Toul. One of course assumes that the French would have some troops on the spot available for mobile defence pivoted on the works. It should be added that there are the two entrenched camps of Langres and Rheims in second line; they are elaborate defensive positions, but are not maintained in the same state of readiness as the defences further forward.

As regards the defence works along the Belgian frontier, there are first of all the old-fashioned (but still serviceable against sudden attack) fortresses, Longwy and Montmedy. Then further to the west there is a well-placed modern fort watching the passages of the Meuse at Mezieres. In the little salient that juts northwards there is a fort at Givet. Further to the west again are two or three modern works near Hirson guarding an important railway junction. Finally, on the Sambre and close to the frontier, is the entrenched camp of Maubeuge, to which a good deal of attention is being paid. The entrenched camp of Little lies further to the west again, but the French are in some doubt as to whether to retain its works armed and in repair. The fortifications covering this front between the German frontier and Maubeuge are by no means to be ignored, but are not of a nature to add very greatly to the difficulties of German forces advancing through Luxemburg and the Ardenned country to debouch into French territory on the left of Verdun, although they bar useful communications. In second line are the already mentioned entrenched camp of Rheims and some works about Laon.

The German Point of View.

In considering from the German point of view the problems which are presented by a campaign against France there is always one matter to be remembered. To them the securing of a speedy triumph is almost imperative, and for a fairly obvious reason. The Franco-Russian Alliance is a factor which has to be taken into account. Russian military forces become very formidable within a few weeks of the outbreak of hostilities, so much so that Austria-Hungary cannot be expected to keep more than a portion of

them in check; and the consequence is that the Germans have to be prepared for the necessity of recalling some of their troops from the western theatre of war at a comparatively early stage of the proceedings. In fact, as against the French, the German armies, formidable as they are, are rather in the position that they have "to get on or get out," and it is largely due to this obligation that it becomes so necessary for them to turn the French lines of defence either *viâ* Belgium and Luxemburg or else *viâ* Switzerland.

And it may here be remarked that certain defensive measures taken of late years in Alsace-Lorraine suggest that as the Berlin General Staff now contemplate a plan of campaign founded on the principle of a containing army or armies in that region, while operating offensively on the flank or flanks. For two or three decades after 1870-71 fortification progress in the newly acquired territory was confined to constructing a girdle of forts round Strassburg and to effecting some minor improvements in the old defences of Metz. But of late years that great place of arms on the Moselle has been furnished with an entirely new ring of detached works, including a large area of country, and a line has been pushed out to take in Thionville and to fill up most of the space between Metz and the Luxemburg frontier. On the other flank, Neu Brisach has blossomed out as an entrenched camp, and certain forts have been constructed barring the communications to the Rhine from about Belfort. A fortified position has also been contrived to the west of Strassburg. Owing to the Vosges and the works towards Neu Brisach. to marshes about Sarrebourg, and to the fact that the gap north of Metz is blocked, a French advance into the "Reichsland" nowadays would have to find its way through certain well defined and somewhat restricted gaps, and this would place considerable difficulties in the way of their undertaking an active campaign of offensive manœuvre. We are always hearing of the millions of men which Germany and France have at their command. The numbers are not so large as some suppose, it is true; but, all the same, neither side could, if confined to the actual Franco-German frontier region. employ the the whole of its forces profitably from the point of view of accomplishing something decisive quickly. What with mountains, and marshes, and lines of fortifications, there is not room enough. It would come to be a case of huge Armies, up against each other, fighting interminable battles of the Liao-yang and Mukden type, the Germans all the time remembering that the Russians were, day after day, heaping up fresh Army Corps on the Vistula and the Niemen preparatory to sweeping forward westwards.

Into the question of a possible German advance through Switzerland it is not proposed to enter here. For various reasons the chances seem to be against any idea of such a move. Nor is it proposed to discuss the political aspect of a German advance through Luxemburg and Belgium, with the possibility which this involves of bringing British naval power and even perhaps British Military power to bear on the side of France. Suffice it to say that the development of German railway communications from the Rhine towards the frontiers of Belgium and Luxemburg is being carried out on such a scale that it can only be accounted for on the supposition that it is intended in case of war to such great masses of men along these lines with a view of turning the French defences by the north through neutral territory.

The Lines of Advance.

That portion of Belgium which lies south-east of the line formed by the Meuse and by its affluent, the Sambre, creates, together with the Duchy of Luxemburg, a well-defined triangle which more or less interposes itself

between Germany and France. Speaking generally, this triangle constitutes a region which is not particularly favourable for the movement of a great Army. It is somewhat broken, is largely clothed in forests, is not very productive, and is rather lacking in railway and road communications. On the other hand, Belgium on the left back of the Meuse and Sambre, is almost an ideal territory for the conduct of operations of war on the largest scale, seeing that the country is open and highly cultivated and that it is intersected with a network of chaussees and railways. It may be suggested, therefore, that if they want to reach France through neutral territory the Germans would be well advised to follow routes on the left bank of the Meuse in preference to adopting lines of operations through the Ardennes country and Luxemburg. But there are certain formidable objections to such a course, and to fully realise their importance it is necessary to bear in mind that Liege is a well designed entrenched camp and that Namur, if not quite so well defended is also a modern fortress. It is also necessary to realise that for practical purposes the whole of the Belgian Army would on mobilisation assemble in the country on the left bank of the Meuse, and that, except within the fortified enclosures of Liege and Namur, there would be no Belgian troops on the right bank. Now in the first place it is obvious that German Armies to reach the French frontier have much further to go if they move along the left bank of the river than if they traverse the Ardennes. Then, again, there is only a very narrow gap between Liege and the tongue of Dutch territory that stretches down South to Maestricht, so that it would be impracticable for German Armies to advance into Belgium on a broad front north of Liege unless they violated Dutch neutrality, while to cross the Meuse between Liege and Namur would obviously be risky, besides necessitating traversing some of the awkward Ardennes country before getting to the river. To escape collision with the Belgian Army and to reach French territory as rapidly as possible, the Germans would almost seem to be compelled to take a line across that triangle of Belgian territory and Luxemburg south-east of the valley of the Meuse, and moreover to take a line as near the south-eastern angle of that region as possible subject to hitting off French territory well clear off Verdun.

For practical purposes Luxemburg may in time of war almost be looked upon as German, jutting out as it does like a bastion into German territory. From the Meuse near Liege to the south-eastern salient of the Duchy is a distance of about 80 miles. Several routes and railways cross the German-Belgian and German-Luxemburg frontiers, leading west by south towards the Franco-Belgian frontier; it is obvious, however, that the further south they quit German territory the shorter distance do they have to traverse to reach French territory, and the less do German Armies following them present their flank to Belgian Forces based on the further side of the Meuse. There is, moreover, a belt of particularly rugged country stretching roughly along the line Malmedy Givet across the triangle, and the tract between this belt and the Meuse is awkwardly close to Liege and Namur. The consequence is that the natural plan of advance for German Armies that are striking at France through Belgium and Luxemburg would seem to be for them to start on a front entending from near Treves northwards to near Malmedy, and from them to direct their lines of march towards the Franco-Belgian frontier between Longwy and Givet.

Distribution of the German Forces.

The Germans can dispose of twenty-five Army Corps in first line, but it is safe to assume that at least three would have to be left from the outset

on the Russian frontier; that leaves twenty-two for disposal. It seems likely that two of these would have to be specially detailed to make head against the Belgian Army, that they would be based somewhere between Aix-la-Chapelle and Malmedy, and that they would advance westwards to the Meuse making Liege and Namur and securing the flank of the Forces that would be simultaneously pushing through the Ardennes country and Luxemburg towards the line Longwy Givet. How the remaining twenty Army Corps available for active operations against the French hosts would be disposed it is hard to say. But it seems likely that not less then five would be detailed to traverse the neutral territory, co-operating with three advancing from the line Metz-Thionville, into the gap north of Verdun, while the remaining twelve would be employed, partly in trying to break through the Toul-Epinal gap and partly in action against the French defensive lines Belfort-Epinal and Toul-Verdun. In other words, eight Army Corps would be employed to turn the French little north of Verdun, while twelve would act more or less in a containing capacity against the French front. Up till within a few months ago there would have been great difficulty in carrying out such a plan as this with the rapidity necessary to give it a reasonable chance of succeeding, because the assembling of five Army Corps between Malmedy and Treves would have taken a considerable time for want of railways. But all this has already been changed and is being still further changed at the present time, as will be shown in a second article.—*The Madras Mail.*

Termites and their Habits.

Two interesting papers on termites and their habits, by Mr. T. Petch (reprinted from the Annals of the Royal Botanic Gardens, Peradeniya, November, 1913) have reached us. The author has already made a special study of fungi which grow in termite nests, and not only serve as food for the insects, but are also frequently cultivated by the latter, and undergo remarkable changes in form and mode of growth as the result. The first paper deals with a supposed association of white ants with a mushroom-like fungus, and though the facts are not yet definitely established, it would seem probable that after a period of cultivation in the termite nest this fungus loses its vigour, and in order to remedy this defect the termites carry spherical masses of the fungus up to the surface and plant them out in places where they will develop spores, which the termites convey back to the nest as "seed" for a new fungus crop.

The second paper is an extended study of the habits of the Colony black termite (*Eutermes monoceros*), which usually builds its nest in hollow trees. The nest contains a single comb, and consists of thin, tortuous plates, irregularly united to form a sponge-like mass with wide passages separated by thin walls; its substance is composed of excrement, fragments of the epidermis of various plants, fungus threads, and spores, and crystals, and the same mixture is found in the stomachs of the workers and soldiers. After describing the process of nest-building, the remarkable organised foraging processings, etc, the author states that lichens form the staple food of the black termite, and that they prefer lichens with loose texture and powdery surface (crustaceous lichens); they prefer algae, but as the supply of these is small in comparison with the extensive growths of lichens on tropical trees, they evidently eat the lichens for the sake of the contained algae, and not the fungal constituent, since they rarely touch fungi even when no other food is available.—*Nature.*

LABOUR,

The Drain of Labour from India.

While other parts of the world are drawing their supply of labour from India, Indian industries are starving for want of labour. Indian labourers are leaving in increasing numbers. Time was when the Hindus were opposed, on religious grounds, to undertaking voyages. Crossing the *Kala-pani* involved the loss of status socially. Among the orthodox Hindus, there is still a feeling against voyages. Only recently there was a fierce controversy between two sections of the Bhatia Community in Bombay on the subject and it eventually resulted in a split. Indications are not wanting, however, that the orthodox Hindus are fast losing their hold over their co-religionists. During the past few years, the number of Indians leaving India in search of work has been increasing, and while the new regulations in regard to South Africa have been successful in checking Indian emigrants there has been a steady increase in the number of Indians going to Penang, Singapore and Hong-Kong. Some interesting statistics relating to the number of persons who left Indian ports in "native passenger ships" have only recently been published by the Director of Statistics which show that the religious objection to voyages does not exercise the same influence over the minds of the Hindus as in days gone by. The total number of Indian passengers other than emigrants and pilgrims, who travelled by sea in 1912-1913 was 2,593,996, while in 1899-1900, it was 1,315,223. These figures include passengers going on long voyages which, according to law, mean that the ship was continuously out of port for one hundred and twenty hours or more, and also those going on short voyages where the ship was not out of port for one hundred and twenty hours. Among the Indians undertaking voyages to places beyond India in 1912-1913 were many who went as far afield as Mombasa, Zanzibar, the Persian Gulf, the Straits Settlements and Amoy. "Of the total number of passengers (namely 2,460,310) carried annually in the last five years, 97·5 per cent, or nearly 2·4 millions, on an average, were carried on short voyages and the remainder (6,606) or 2·5 per cent. on long voyages. About 12 per cent. of the passengers voyaged to ports out of India, that is approximately 290,000 on an average left India annually, and over 2 millions or 88 per cent. moved within the limits of Indian waters."

These figures are of interest both to the employers of labour in India and to others who are now studying the wider Imperial question of Indian emigration. To the planters in India, they show that while the tea and other industries here have not sufficient labour, other parts of the world are receiving a steady supply of labour from India. The Straits Settlements attract a large number of emigrants every year. The number of Indians who left Calcutta for Penang shows the steady drain of labour from India. In 1910-11, the number of emigrants bound for Penang was 3,438. In 1911-12, it had increased to 6,862 and in 1912-13, the number was 6,546. The figures for Singapore are also interesting. In 1910-11, 3,159 Indians proceeded to Singapore; in 1911-12, 3,398; and in 1912-13, 3,053. When one also takes into account that no less than 177,000 persons left Madras for employment on the tea plantations in Ceylon, the injustice to the tea planters in Assam of barring to them fields of recruitment of labour in India becomes apparent. The conditions of labour in the Straits Settlements or Ceylon could not be so different from those in Assam as to make

the Straits or Ceylon a coolie's paradise and to make Assam a coolie's grave. As a matter of fact, judging from the large contingents of Indian labourers and artisans who have shown themselves willing to leave the Straits Settlements at the bidding of agitators to seek "fresh fields and pastures new" in Canada, and incidently to create an immigration problem for the Canadian authorities, the conditions of labour in the Straits could not be idyllic as some would have us believe. In connection with the emigration of Indians to Canada, it may be pointed out that according to the Director of Statistics, 3,380 Indians left for Hong-Kong in 1910-11—the year of the opening of the Canadian emigration campaign in India:—1,112 in 1911-12, and 741 in 1912-13. A large proportion of these emigrants were evidently bound for Canada and it is also probable that among the thousands of Indians going to the Straits Settlement there were many who eventually intended taking ship at Penang or Singapore for Canada.

The statistics conclusively show that the old dread of the *Kalapani* is giving place in India to a desire to seek fresh fields of employment wereever found. It is a stupendous economic mistake under the circumstances to harass those interested in developing industries in India in their efforts to obtain their labour from the country itself. Of course, if the conditions of labour in the plantations in Assam and elsewhere in India were such that a paternal Government like the Government of India could not allow Indian labourers to work under them, then it would not be a herculean task to remedy them. But if Indian labourers are allowed to go to distant Fiji where, according to some accounts, the conditions are the reverse of ideal, the reason which prompts the Government of India to treat Assam as a Cindrella in the supply of labour is shrouded in mystery. There is, however, not the remotest justification for believing that the conditions of labour in Assam are, in any way, worse than, say, those in Fiji or for the matter of that in any other part of the world where Indian labourers go. On the contrary, Assam can compare very favourably as a field of labour with any other place. Moreover, Assam offers advantages to the Indian labourer which other places do not, and above all, the Indian labourer in Assam plays his part in the development of the economic wealth of his country. Even if there were need for reform in the system of labour in Assam, this could easily be achieved by the Labour Bureau which the Government has agreed to establish in Calcutta. The delay however in creating the Labour Bureau and in dealing with the labour question generally in Assam does not show that the Government values the tea industry at its proper worth. Here is a great future appealing to the Government for its assistance in solving its labour problem, and the Government seems to have turned a deaf ear to its appeals. Here are Indian labourers migrating in their thousands to distant lands where the doors are rudely closed in their faces, when one word from the Government would turn them towards Assam where they would be welcome. Indian labourers leave their native country for the Straits and Canada in search of employment and it stands to reason that if they found employment nearer home they would not even dream of undergoing hardships in foreign lands. Here is then a solution even for the Indian emigration problem. By offering the planters of Assam facilities for recruitment of labour in India, the Government would not only put a stop to the steady drain of labour from the country, it would also go very near solving the Indian immigration problem for the Colonies.—*Englishman*, 18-7-14.—*The Indian Planters' Gazette and Sporting News.*

LABOUR DEPARTMENT.

The Labour Problem in India,

A good deal has been published in our columns in the immediate past regarding the drain of Indian labour to British and other Colonial possessions; and the subject has been brought once again to the front by a number of circumstances, not the least of which is the formation of a Labour Department in connection with the United Planters' Association of Southern India. The case for the new organization has also been thoroughly discussed and is familiar to all concerned, so there is no deed at this juncture to say more than that if this Department can do something to check the very serious drain of labour that is taking place, from south India particularly it will justify its existence, not only for the planters for whose benefit it has been primarily formed, but for agriculture and industry in Southern India generally, where the shortage of labour is felt even more severely than elsewhere. That it is common all over India is a matter of general knowledge, and the Government are feeling it almost as much as private individuals. Sir William Meyer, in his speech to the Indian Merchants' Chamber of Commerce in Bombay, bore testimony to this fact. We have on more than one occasion pointed out that it is not only the planting industry alone that is affected. Many years ago, the Mirasiders of Tanjore, through the District Association, called upon the Government of Madras to take action in this matter. A resolution to check wholesale emigration was more recently moved in the Madras Legislative Council. The Government are loth to move in the matter, being satisfied, apparently, the conditions under which this labour is recruited and maintained is above reproach. The fact that it is likely in time to affect the economic condition of the country does not seem to weigh in the balance at present. Consequently, it remains for those interested to do what they can to work out their own salvation, and this is why we welcome the U. P. A. S. I. Labour Department as action necessary in this direction.

How necessary some action is shown by the figures which have just been issued by the Director of Statistics of the number of Indians leaving India under conditions governed by the Native Passenger Ships Act, These prove conclusively that the Indian has lost his stay-at-home proclivities and his religious and sentimental objections to crossing the sea, and with the disappearance of these objections the numbers leaving the country are steadily increasing at a rate that calls for thought. All, possibly, are not labourers, but such a large proportion of them are that there is need to force the argument in pointing out to the gravity of the situation. Putting aside altogether the general figures, and confining ourselves entirely to those which have reference to South Indian emigration, we find that, during the calender year 1913, 117, 783 individuals went to the Straits Settlements, 190.059 to Ceylon, and 130, 725 to Burma. These figures are not from the statistical returns referred to above, but from the Report of the Protector of Emigrants, Madras, which are more up-to-date, as they refer to the calendar year 1913, and not the official year 1912-13. They also show an appreciable increase over the figures of the Director of Statistics. It is safe to assume that the great majority of these were labourers, so that the demand for labour from this Presidency can be adequately gauged. Compared with other Provinces in India, it shows that this Presidency supplies almost all the Indian agricultural labour in Ceylon and the Straits Settlements. It is cold comfort to know that our labourers are so much in demand elsewhere that it is getting increasingly difficult te get them ourselves. The position will become more acute if Assam can eventually break down the opposition of the Govern-

ment of Madras, and is allowed to recruit for planting labour in this Presidency as well. However justifiable the reasons actuating the Madras Government in taking up this attitude may be, to the ordinary man it appears a little illogical, to throw every obstacle in the way of Assam when emigration, regulated and unregulated, to British possessions beyond the sea is freely permitted. If, by any chance, however, Assam gains its point one wonders what the condition will be in the labour fields of South India.

No one desires any step to be taken that will interfere with the freedom of the individual to sell his capacity for work in the best market, be it Assam or anywhere else, provided that proper precautions are taken regarding the treatment of coolies travelling to and fro and while on plantations; but all do not take the same complacent view as the Madras Government in this matter. Only recently we had occasion to call attention to the controversy raging last year regarding the condition of the Indian labourers in Fiji. As we have pointed out, the allegations of one side are strenuously denied by the other, but the fact remains that opinions on the subject are divided, and there are still independent enquirers who take by no means as favourable a view of the situation. For instance, Dr. Charles W. Eliot, a distinguished American who recently undertook a tour in the Far East at the instance of the Carnegie Endowment for International Peace, has some very pertinent remarks to make on this very subject of the regulation of emigration of labourers. "The regulation of emigration and immigration" he says "should be the object of anxious care with all the Oriental Governments, whether alien or native; and great pains should be taken to prevent emigrants from leaving their own country under conditions that will involve them in serious moral and physical deterioration and economic loss.

Wherever large bodies of unmarried men emigrate to a strange land in search of work under conditions imperfectly known to them, the chances are that they will live in barracks on isolated plantations, or near isolated mines or factories, and that family life will be impossible for them. Under such circumstances, labourers degenerate rapidly, both morally and physically, and out of their wretchedness come inter-colonial, international and inter-racial disputes."

It is practically certain that the Government of Madras will deny that the labour they allow to emigrate experiences conditions such as those quoted above. For instance, in the Report of the Protector of Emigrants, Madras, for last year, a point is made of the fact that particular care was taken to ensure that the proper proportion of married couples formed part of each shipment to Fiji. But the fact remains that by far the larger proportion of labourers are unmarried men, or men who have left wives behind, and it may be possible that their conditions of life are not far remove from those described above. Whether this is so or not, however, is beside the question as to whether the existing drain of labour from South India is or is not a serious and growing loss to the country. We have merely mentioned it to show that all who have examined the question of labour emigration are not unanimous in the opinion that it is regulated under conditions that do not call for criticism. It may be, of course, that the balance of evidence is in favour of these Colonies being, if not a coolies' paradise, at least very satisfactory fields of labour, in which case it is impossible for the Government to interfere. As a matter of fact, however, we are not asking for any Government interference, unless it is justified. What seems absolutely necessary is that something should be done to make the coolies' prospects comparatively as attractive in his own country as they are elsewhere.—*The Indian Planters' Gazette & Sporting News.*

CORRESPONDENCE.

4, South Parade,
Bangalore, 11—8—14.

Kalisyndikat Experiments.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—In the *Planters' Chronicle*, of the 8th current appears a letter by Mr. C. S. Crawford concerning *inter alia*, the above experiments in Mysore.

In case of possible inference to the contrary, might I mention that the subsidy granted by the Syndicate to the U. P. A. S. I. to cover expenses of the scheme still permits of an increase in the number of experiments already laid down.

Intimation from planters of their willingness to conduct any of the experiments will, I feel sure, be as warmly welcomed by the Mysore Scientific Officer as by myself.

Yours faithfully,
ROBT. BIRNIE.

IMMIGRANTS AND EMIGRANTS.

The number of immigrant labourers who arrived in Ceylon in 1912 was 117,475; in 1911, 97,536. The average during the previous six years was about 78,000. The arrivals are, however, largely counter-balanced by the departures. The departures were 77,840, so the excess of arrivals over departures in 1912 were 39,635. Apart from coolies returning to their homes, the main stream of emigration from Ceylon is rather to the Straits Settlements and the Malay States than to India, and the number of Ceylonese, especially from the north of the Island, who of late years have sought a living in the countries named is considerable.

POPULATION.

			Per cent. of total population.
Total population of Ceylon in 1912	...	4,189,000	...
Tamils (indigenous)	...	611,100	14·5
„ (immigrants and their descendants)	...	518,500	12·4

—*Indian Planters' Gazette.*

Rough Test of Soil for Lime. "Sisal (Agave rigida var. Sisalana)," says "The Queensland Agricultural Journal," "will not thrive without a certain proportion of lime in the soil. It is very easy to ascertain whether this is present or not, by taking a portion of the soil and pouring some hydrochloric acid in it. If lime is present, an effervescence will follow. Should this not occur, it will be necessary to apply lime before planting. About one ton per acre would be sufficient. The above test will not tell you what quantity of lime is in the soil; it merely shows that it is there."—*The Rubber World.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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PLANTERS AND THE WAR.

At a meeting held in Madras on the 14th instant called under the auspices of the U. P. A., a representative body of the planters and Coast Firms met under the presidency of Mr. J. A. Richardson, Chairman, U. P. A., who wished it to be clearly and distinctly understood that at this crisis the meeting was convened in the interests of the Planting Community, and in no way antagonistic towards the Banks, who as all know would do all they could for us, so that we could get the latest news at first hand and make what arrangements that might be necessary without delay. On the 13th the position stood as follows:—The Banks were prepared to buy Bills against existing Tea Credits at not more than three months sight at the following rates:—

Bills at	3 months sight	...	...	1—4½
„	60 days „	...	...	1—4⅜
„	30 „ „	...	...	1—4⅞
„	On demand	...	...	1—4⅛

After mid-day on the 13th, on a wire from London, Banks were prepared to buy Bills against Rubber credits, so that it was hoped that our difficulties were over in that direction. There is some difficulty in the drawing of bills and that is the Banks are asking for two distinct signatures, that is, that the drawer and the drawee should not represent the same company or firm. The drawer should sign as Superintendent of the Estate and the drawee in most cases will be the home firm of agents. This makes the proprietors of Estates liable as well as the agents at home for whatever bills are drawn, and one Bank advised that it would be an advantage for Superintendents drawing bills to hold a Power of Attorney from their proprietors, but every day things seem to be easing down and banking business resuming normal conditions. Just before the meeting the Chairman received a telegram from Home, "Straits and other Governments financing planters thirty cents per lb. rubber, appeal Madras and Travancore Governments assistance." 30 cents represents about 9*d* per lb. The Secretary, U. P. A. S. I., was instructed to write to the Government of Madras and Native Governments in the above sense. Another instruction was given to the Secretary by Resolution "That the Secretary, U. P. A. S. I., be instructed to address the Government of Madras and the Government of Native States requesting them to take immediate steps to put a check on the unnecessary raising of rates of provisions, etc., in all mofussil shops and bazaars." The latest telegrams to the Banks state matters are steadily improving and this will no doubt ease the position of Coast Firms, and planters' temporary financial difficulties. The Chairman received from the Bank of Madras the following information which shows that the Government of India is doing all it can to help. "In view of the probability of mails being late, the Government of India with the permission of the Secretary of State has arranged to cable to London the

name of the payee of each demand bill sold and payment will be made by the Secretary of State in London sixteen days from the date of issue of the Bill." A good deal of discussion took place on the question of two separate signatures on a Bill being necessary and it was asked if the Banks would not waive their insistence of this condition, but it was pointed out that the Banks could not be expected to give a general assurance that would cover every case. Individual cases would have to be treated separately. Everything depended on the position of the Company or individual. It was not thought that the condition would be waived. They might in the case of particular individuals and Companies, but they could not give a general assurance.

As far as Companies and large proprietors were concerned the meeting was satisfied for the present. But the Chairman would like to throw some ray of hope on the prospects of small proprietors who were affected. The only advice he could give them was to approach the Banks individually without delay. The object of the meeting was to do something for them and to take the news back to them. The feeling was that the Banks were acting in conjunction and were in consultation with one another. The question of the credits of Tea and Rubber having been thoroughly discussed it was asked if stocks as in the case of the Madras Bank would be guaranteed and Mr. Christie said that all they (the West Coast Firms) could do at present would be to arrange for as frequent shipments as they could manage.

Shipping freights were discussed and the Chairman said he had received a telegram that the Clan Line in common with other shipping Companies had increased 25 per cent. the freight on all future shipments. The advance of 25 per cent, was heavy enough but he thought they were asking too much when they demanded payment in advance. In discussion there did not seem much hope at present of reducing the increased freight but it was hoped that the question of payment might be waived. It was just possible that the Banks in addition to sending the Bill of Lading would send an additional Bill attached for the freight. That would be one way out of the difficulty.

The rise in prices was discussed and the Secretary, U.P.A., was instructed to write to the Governments concerned as stated above.

Rice supplies were also discussed and Mr. Jourdain said there had been a shortage of rice and the prices had gone up considerably. The B. I. S. N. Co. had put a stop to any speculation by putting a steamer on to bring a full cargo of rice from Bassin and the prices had since subdued.

Manures were discussed in connection with the curtailment of expenditure in cultivation. As many of the Agents were present, the Chairman sked their views as to the possibility of maintaining supplies in view of the War.

Mr. Stanes said many planters as far as his firm was concerned had cancelled their orders. The manure was there if the planters wanted it.

Mr. Bernard said there had been no increase in prices.

Mr. Mackie said he had received a cablegram saying that the expenditure on cultivation should be reduced to a minimum. This was the general opinion of the meeting.

Mr. Nicolls said the whole question would require very careful handling seeing that coolies had been guaranteed work for ten months. If they dismissed their maistries they would be liable for the advances and for the wages. The Chairman said they must give their labourers work but that work must bring in some return. The following resolution was passed unanimously: "That this meeting accord a hearty vote of thanks to the Madras Banks for the way they are endeavouring to meet the requirements of the Planting Community".

With a vote of thanks to the Chairman the meeting closed.

DISTRICT PLANTERS' ASSOCIATIONS.

Coorg Planters' Association.

Proceedings of an Extraordinary General Meeting held at the Bamboo Club, Pollibetta, on 13th August, 1914.

PRESENT.—Messrs. W. H. Sprott, J. A. Graham (President); R. Hamilton, G. L. Newberry, H. Hammond, N. M. Scholfield, F. Macrae, E. L. Mahon, H. T. Shaw, E. M. Breithaupt, G. Haller, (Director of Agriculture, Coorg); H. Jackson, C. Appiah, A. B. Chengappa, W. R. Wright, W. H. Sheldrick, H. G. Grant, A. J. Wright, W. A. F. Bracken, and P. G. Tipping (Honorary Secretary). *Visitor*:—M. B. Pollard-Urquhart.

Mr. Sprott was elected Chairman and thanked the Meeting for the honour done him and expressed great pleasure at meeting so many old friends and being present at a C. P. A. meeting again.

The Honorary Secretary then explained his reasons for calling the meeting and read telegrams and circulars from the Chairman, U. P. A. S. I., which had not already been circulated. Messrs. Gerrard, Shaw, Mahon and Sprott spoke on the financial position and no collective action was considered necessary.

The question of unwarranted raising of bazaar rates was brought up. The Honorary Secretary having already addressed the Commissioner of Coorg on the subject, Mr. Chengappa informed the Meeting that notice had been given in Virajpet on bazaar day, that those unduly raising rates would be prosecuted.

Messrs. Graham and Tipping proposed and seconded the resolution: "That Government be thanked for the steps already taken and ask that order may be strictly enforced." Some minor matters having been dealt with it was unanimously resolved that the business of the regular Quarterly General Meeting should be disposed of at this Meeting.

Mr. Sprott said that before the business of the Regular Meeting began, he would like to again give expression to the pleasure it had given him to be honoured in this way and with the Meeting's permission he would like to give place to Mr. Graham who was more in touch with matters concerning the Association.

Report of the Delegates to the Annual General Meeting of the U. P. A. S. I. held in Bangalore, on 6th and 9th July, 1914.

Mr. Chairman & Gentlemen,—You have all doubtless read the proceedings of this Meeting as reported in the *Madras Mail* and the *Planters' Chronicle*. Though this meeting marked the inauguration of the Labour Department of Southern India, it was otherwise an uneventful Meeting. As regards the working of the Labour Department, we cannot give any more information than you have gathered from various articles published dealing with the same. The rules are not drawn up yet, but the matter is in the hands of experienced men, who can be relied on to compile carefully thoughtout and comprehensive rules for the working of this Department. A rule regarding those joining the Department after 30th June, 1915, making the subscription Rs. 3 per acre for the first year after joining, instead of Rs. 2, as in force till the expiry of that date, was passed and was supported by us.

SCIENTIFIC DEPARTMENT.—We were given to understand in Committee, that the Government of Madras was willing to meet us in the matter of taking over this Department provided we are prepared to bear a fair proportion of the cost. On the face of the estimated cost of the Department, it was considered a most advantageous offer, but unfortunately the necessary funds were not available. But it is to be hoped that it will be possible to overcome the difficulty, and that Government will keep their offer open till then.

Dr. Leslie Coleman, Director of Agriculture to the Mysore State, gave us some useful hints in the course of his interesting speech. Our most hearty thanks are due to him for the very obliging way in which he gives us the benefit of his experience and experiments and is always ready to help those who appeal to him—a most pleasing contrast to some we have experience of.

There being nothing further of much interest to this Association to mention this concludes our report.

Messrs. Macrae and Graham then proposed and seconded the following resolution which was carried: "That the Honorary Secretary be empowered to write to the U.P.A.S.I. Council, intimating to them that this Association is prepared to subscribe its share towards the amount required for the Government of Madras to take over our Scientific Department, provided that other Associations also subscribe in some proportion."

The Banking of the C. P. A. and U. P. A. S. I. funds was brought up and after some discussion was dropped.

S. I. P. B. FUND.—Some questions were asked about disbursement of fund monies.

Dr. Coleman's Circular re. co-operative purchases of insecticides was read and the Honorary Secretary was asked to circularise members to register their names with quantities required.

Read the Commissioner's reply to letter *re.* adulteration of Arrack, and satisfaction recorded that steps were being taken to detect offenders. Messrs. Bracken and Macrae proposed and seconded a vote of thanks to the Delegates. Carried.

Mr. Mahon drew attention to the continued neglect of proper repairs being undertaken on the Coorg-Tellicherry Road, beyond the Coorg frontier, and suggested that the Governor be approached in the matter, during his coming tour in Malabar.

Mr. Shaw drew attention to the neglected state of the Kutta Road, and was asked to write in a specific complaint *re.* same.

A vote of thanks to the Chair terminated the Meeting.

(Signed) P. G. TIPPING
Honorary Secretary.

The Honorary Secretary asked members who did not get their notices, &c., direct to kindly register their correct addresses with him; he also took this opportunity of reminding those who had not already paid, that their subscriptions for 1914/1915 were due on 1st June.

South Travancore Planters' Association.

Proceedings of the General Meeting held at the Quilon Club, on Saturday, 1st August, 1914, at 10-30 a. m.

PRESENT.—Messrs. L. G. Knight (Chairman), A. M. Leslie, C. Brander, L. M. Young, C. Hall, J. B. Cook, A. V. Cree, A. Marten, T. P. M. Alexander (Honorary Secretary), and E. J. Smith and J. Mackie (Visitors).

Mr. J. B. Cook's Speech at Bangalore.—Mr. Chairman and Gentlemen,—As you elected me to represent this Association at the Annual General Meeting of the U. P. A. S. I., at Bangalore early this month, I attended as instructed, and do not think it is necessary for me to give you an account of the meeting from start to finish, as you have no doubt read all about it in the *Chronicle* and other papers. It was a very short meeting this year which I think tends to show that we are more contented, and probably have less problems for settlement than formerly. The subject that will interest you most is no doubt the Labour Commission, and as instructed I pointed out to the Meeting that the Labour Committee was too much under the control of one Firm, and that your opinion was that if this was altered a much larger acreage would probably join the Comission. It was, however, too late to do anything in this direction as North Travancore had laid down their conditions and about 95,000 acres had joined the scheme by the lst July. I think I am correct in saying that a number of planters who have put their estates into the Labour Commission only did so because their neighbours had joined and they thought it better to be in the Commission than out of it. Mr. Pinches gave a clear account of why his firm insisted upon having at least two of their men on the Committee. After some discussion it was decided that the eighth Labour Committee member was to be appointed by the U. P. A. S. I. and not by the five members of the Committee. One rather amusing error happened in the fact that my few remarks on the formation of the Committee were reported in one of the Madras papers as being made by Mr. Pinches, who was of course the very gentleman they should not have been credited to. There were various suggestions made as to what terms new members could join the Commission on, and it was finally decided that one year's grace *i.e.* to 30th June, 1915, is to be given, and after that an entrance fee of Re. 1 per acre be charged, plus the annual subscription of Rs 2. The Labour Commission funds will be kept entirely for that Commission, and in the meantime until Mr. Martin returns about September Mr. Norton is acting for him. Mr. Day has been appointed second Commissioner. I think this is the gist of what interests us about the Labour problem, and will be glad to answer any questions you may wish to put.

Rate of Women Tappers.—After a discussion it was the opinion of the meeting that the rate for women tappers should not exceed five annas in the Check Roll.—Carried.

Rubber Growers' Association.—After discussing the West Coast Planters' Association's letter *re.* the forming of a Rubber Growers' Association, Mr. Brander proposed and Mr. C. Hall seconded that the meeting is of opinion that the matter might be readily left to the recently formed Combined Travancore Association.

Subscription to the U. P. A. S. I.—Proposed that as provision has not been made for paying the increased subscription on the 2 anna basis for the year ending June, 1914, this meeting considers that it can only pay at the increased rate for the year starting July 1st, 1914. Carried

It was agreed that the District Traffic Superintendent, the Conservator of Forests, the Executive Engineer, the Dewan Peishkar, and the Medical Officer be invited to be Honorary Members to this Association. Carried.

(Signed) T. P. M. ALEXANDER, *Hony. Secretary.*

COFFEE.

The Commercial Aspect of Coffee.

A Scholarly and extremely interesting Lecture by J. H. Brindley, Manager of Coffee Department of Brooke, Bond & Co., London, England. Before School of Economics, London University—Printed herewith by special privilege of the Author.

Let us turn to the customs archives and from their unemotional records note the vicissitudes of the taxation of coffee. In addition to the liquid tax I have mentioned, William and Mary in 1695 imposed a customs tax of 6*d*, per pound. Again in 1698 new legislation replaced the liquid tax probably from the difficulty of rightly assessing and collecting it, but imposed the heavy customs tax of 5*s*. per pound. The term "customs," be it remembered, was originally used in an extensive sense for *customary* payments or dues of many kinds, regal, episcopal or ecclesiastical, but in course of time it was restricted to the duties on commodities payable to the King, either import or export. These were first farmed out, and not till 1671 were they taken into the King's own hands and entrusted to a board of Commissioners.

In 1704 a further 6*d*. per lb. added to the total customs duty on coffee and spices brought in the sum of £36,967 and an additional duty of £66.222, and in 1727, the closing year of George I reign, the amount so credited is £42,162 and an additional £1,559, but I am unable to unravel how much of this was contributed by coffee and spice, respectively. If, however, the order of values was similar to that of the Dutch cargo of 1739 it would seem fair to assume that coffee was the predominant factor.

By 1800 the growing menace of the Napoleonic struggle had necessitated special naval protection for our merchant shipping and it was made illegal to bring in produce or take our merchandise unless the ships containing it were escorted by men-of-war to minimize the risk of capture and so the tariff reads:

Coffee 2 2 4 4-20 per cwt. plus, Convoy 3 4. Excise if from British possn.: 1 1, or foreign 2*s*. 2½*d*. per lb.

In 1805. On importation by East India Co. to be secured in warehouses, £3 3*s*., 9 per cent. When taken out of warehouse for consumption in Great Britain, 6⅜ per lb., plus excise on British plantations, 1*s*. 7*d*. per lb. East Indian, 2*s*., and all others 2*s*. 6*d*. per lb.

In 1816, when the power of the tyrant had been broken and the great struggle ended, we read: "On coffee imported by the East India Co., 5*s*, per cwt. Warehousing duty. When entered for home consumption, 5*d*. per lb. Excise duty on the growth of any British plantation in America, 3*d* per lb., from British plantations in East India, 6*d*. per lb., and all others, 2*s*. per lb."

This is the first mention of America as a country of origin, and it is fair to assume that till then the importations from the western hemisphere, if any, must have been a negligible quantity. But why America is favoured in comparison with the East Indies I cannot definitely state. I should conjecture, however, that having lost our New England colonies, it was deemed good policy to do everything possible to foster the infant industries of our West Indian plantations. Possibly the British plantations referred to in 1805 as subject to preferential tariff may also have meant the transatlantic sources, but if so the fact is not stated. Gradually and greatly to be approved, the tax became at the same time lighter and less complicated; thus in

1823. Any British colony or plantation in America or Africa (where would the British African plantation of 96 years ago have been ?) 1*s.* per lb. Any other country, 2*s.* 6*d.* per *lb.*

1825. From any British possession in America, 6*d.* From any countries within the East India Co.'s charter, 9*d.* From any other country, 1*s*, 3*d.*

1842. From any British possession 4*d.*, or any other country 8*d.* per *lb.*

1844. Reduced the any other country duty to 6*d.*

1851. April 15, first free trade policy duty, British or foreign, 3*d.* per lb; kiln dried, roasted or ground 6*d.*

1855. April 21. 4*d.* and 5*d.* per lb., respectively.

1857. April 6. 3*d.* and 4*d* per lb., respectively.

1872. May 1. Reduced to 14*s.* per cwt., and kiln dried, 2*d.* per lb., and a drawback allowed on all coffee exported as ships stores, or removed to the Isle of Man for consumption there, equal to the import duty on raw coffee.

In July, 1897, it was enacted that: "There shall be allowed on all roasted coffee exported, not mixed with chicory or any other substance, a drawback on every full 100 lbs. thereof equal to the import duty for the time being on 1 cwt. of coffee"

So for more than 40 years the coffee duty has been the not very onerous sum of 14*s.* per cwt., and the fact that for so long a period this has been untinkered with leaves, coffee merchants and consumers alike free from any grudge against the many Chancellors of the Exchequer, who, since 1872, have assessed as seemed best to them, many commodities which contribute to our national necessities. Indeed, to one of them, Austen Chamberlain, is due the thanks of those who were more irritated than hurt by the additional ¼ per cent. surtax, which he graciously removed in June, 1905.

The Coffee Trade of the World.

To arrive at an intelligent conception of the magnitude of the coffee trade of the world it may be convenient to adopt the standard furnished by a similar commodity, and the natural direction of our inquiry will suggest a comparison with tea.

Lecturing here last year, John McEwan states that the world's production is, roughly, 700,000,000 lbs. of tea per annum, and he illustrated the greatness of the industry by quoting the new reservoir at Chingford, which has a capacity of 300,000,000 gallons of water, and that the liquid tea capable of being made from the world's supply would fill that reservoir 29 times over.

Recollecting that coffee, if made to my liking, must be in the generous proportion of 1 oz. to the pint, I do not think I will challenge the liquid Niagara of tea, but I fancy I shall surprise some of my hearers by claiming for coffee a marketable weight of nearly four times that of tea.

Say, nearly 2,600 million pounds of coffee per annum, against 700 million pounds of tea! If we allow 10 million pounds to be taken off this estimate for contingencies, we have still to deal with 1,250,000 tons. Imagine, for the sake of argument, the whole of this having to be dealt with actually in London, as most of it is financially. Even in these days of leviathan steamers, a cargo boat of 5,000 tons is far above the average capacity of such vessels. Yet it would acquire a fleet of 250 such to transport in one voyage the world's annual production of coffee.

I had the intention of asking you to further follow my calculation by imagining the whole crop being carted off from the docks in cartloads of one

ton each and, allowing a space of five yards for every such vehicle, but as I find London to John O'Groats and back would not give sufficient room for my procession, I will abandon that illustration and ask you to imagine 3,160 train loads of 400 tons each which would be required to move the bulk. Think of ocean freights only and the rate from Santos to London, which is a competitive one and likely to be less than the average paid from port or country of production to that of the consuming country, and this is 40*s.* per ton. Even that great coffee drinking country, the United States, has almost all its supplies carried in English bottoms, and the rate from Santos to New York is 50 cents. say, 2*s.* per bag.

Probably the United States has its capital more profitably employed in other forms of industry, but the only important concern offering out rates and challenging the supremacy of the conference agreement by advertising its independence is (or was) the Brazilian Lloyd Co., of which I read in the *Financier* of January 10th, that the Government are inviting tenders for its property, including fleet of steamers and all movable and real effects owned at Rio, which were valued at £2,928,000, and no offer might be below that sum.

As about a million tons of coffee annually requires ocean transport, and quite a large quantity must be to destinations at higher freights than I have quoted, I estimate that 2¼ million sterling must come to the shipping companies in this manner, and that the British concerns engaged in the traffic cannot be drawing much less than £2,000,000 annually from this source. Doubtless the lion's share falls to the Royal Mail and Pacific Co., who have also recently acquired the important business of Lamport and Holt. The Pincè line also moves a good quantity, but coffee is a very sensitive article and easily takes contamination from any other strong smelling product, and this renders ships carrying fruit, hides, or meat quite unfit for its transport.

Now as to the area under cultivation: The Brazilian State of Sao Paulo alone has more land under coffee than all the rest of the world together. In the following table, while a number of the smaller producers have had to have their acreage estimated from their average crops, the larger figures are those officially given, and the rest would not greatly affect the total.

Sao Paulo	... ...	2,329,614 acres.
The rest of Brazil	... ...	330,024 ,,
India	... ...	203,610 ,,
Venezuela	... ...	200,000 ,,
Salvador	... ...	156,039 ,,
Porto Rico	... ...	150,000 ,,
Guatemala	...	145,000 ,,
Java and Sumatra	... ...	125,000 ,,
Hayti	... ...	125,000 ,,
Mexico	... ...	120,000 ,,
Colombia	... ...	92,000 ,,
Costa Rica	... ...	84,375 ,,
Nicargua	... ...	76,000 ,,
Arabia	... ...	50,000 ,,
Ecuador	... ...	32,000 ,,
Jamaica	... ...	25,230 ,,
Abyssinia and Somaliland	...	18,000 ,,
Cuba	... ...	13,200 ,,
Peru	... ...	13,000 ,,

East Africa and Uganda	...	10,000 ,,
Honduras ...	...	10,000 ,,
San Domingo ...	...	6,000 ,,
Hawaii ...	...	5,000 ,,
Guadalupe ...	...	4,000 ,,
Fed. Malay States ...	...	4,000 ,,
Argentine ...	...	3,300 ,,
Nyassaland ...	...	2,000 ,,
Ceylon ...	...	1,769 ,,
Madagascar and Reunion	...	1,000 ,,
Queensland ...	...	237 ,,
Natal ...	...	67 ,,
		4,345,465 acres.

Of this Sao Paulo's 2,329,614 acres are officially valued at £100,000,000

Take the balance of the Western Hemisphere including the rest of Brazil, 1,596,868 at £30 acre ...	£47,906,040	
And the rest of the world, 418,983, at £20 acre ...	8,377,860	£156,283,900

To this must be added the value of railways and steamships, docks, piers and warehouses devoted chiefly or exclusively to conveyance and storing of coffee, which can scarcely be less than 10 per cent additional, pay, £31,256, 780, and to this add the world's average visible stock of 11 million bags, which might fairly be taken at £33,000,000, making a grand total of £220,540,680.

As with the acreage and amount of capital invested in the industry, so our estimate of the number of people employed in it cannot lay claim to mathematical precision, but as to the State of Sao Paulo such definite statistics are officially given as should prove valuable factors in arriving at a reasonable conclusion. Here it is common to find plantations of from 300,000 to 400,000 trees, and not infrequently of as many as 800,000. One plantation, near Ribeirao Preto, has no fewer than 5,000,000, requiring 6,000 employes to look after them. One owner has a group of 32 adjacent plantations with 7,500,000 to 8,000,000 trees, which necessitates the employment of 8,000 people. Altogether in this State alone 420,000 people are constantly engaged in the production and transportation of coffee. A large proportion of these are recruited from Italy and Spain, and it is fair to assume that their labour is of a more efficient type than either African or Asiatic, with whom we shall have to compare them.

If, therefore, we allow a greater efficiency of 25 per cent. to European labour, which should be quite on the safe side, and a production of 634,810 tons annual to Sao Paulo and 385,196 for the rest of the world, we should for the latter add 321,000 labourers, or a total of 741,000 employed in the countries of production alone. To this greater number must be added ocean, rail and river transport workers, dock and warehouse porters, merchants, dealers, salesmen, roasters, packers and clerks, and it is not unreasonable to conclude that this commodity finds employment for over 800,000 people and more than £220,000,000 capital.—*Simmons' Spice Mill*,

To be continued.

RUBBER.

Rubber Exhibition.

Distribution of Awards.

There was an agreeable sequel to the International Rubber Exhibition, held recently at the Agricultural Hall, when Sir Henry A. Blake, G. C. M. G., ex-Governor of Ceylon and President, attended at the offices of the Rubber Growers' Association and distributed the prizes and trophies awarded by the Judges.

Rubber Growers' Association Competitions.

No 1—Class I.—Gold medals, The Kintyre Tea Estates Co. (Ltd.) and the Balgownie Rubber Estates (Ltd.) ; silver medal, the Inch Kenner Rubber Estates (Ltd.) ; bronze medal, the United Serdang (Sumatra) Rubber Plantations (Ltd.)

Class II.—Gold medal, the Highlands Pará Rubber Co. (Ltd.) ; Silver medal, the Seafield Rubber Co. (Ltd.) ; bronze medal, the Jugra Land and Rubber Estates, (Ltd.)

Class III.—Gold medal, the Highlands and Lowlands Pará Rubber Co. (Ltd.), silver medal, the Kintyre Tea Estates Co. (Ltd) : bronze medals, the Jugra Estates (Ltd.) and the Pataling Rubber Estates Syndicate (Ltd.)

Mr. John McEwan's Cup.—Mr. R. D. Greenhill, Manager of Highlands and Lowlands Estate, in the Federated Malay States.

Mr. Thomas North Christie's Cup. Mr. J. Farley Elford, Manager of the Ayr Estate (Kintyre Tea Estates Co , Ltd.)

Mr. E. L. Hamilton's Cup.—Mr. P. F. Wise, Manager of Balgownie Estate, in the Federated Malay States.

Competition No. 2.—Gold medals, Government of Ceylon and Government of the Federated Malay States ; silver medal, Harrisons & Crosfield (Ltd.).

Competition No. 4.—Gold medal, the North British Rubber Co. (Ltd.) ; silver medal, the Leyland and Birmingham Rubber Co. (Ltd.) ; bronze medal, the Northern Rubber Co, (Ltd.)

Competition No. 5.—Gold medal, the Leyland and Birmingham Rubber Co. (Ltd).

Competition No. 6.—Cash prize of £50 and gold medal, Mr. Morland M. Dessau, for application of rubber to road paving.

Competition for Rubber Soles for Boots and Shoes.—Bronze medal, the English Rubber Co., (Ltd.)

Rubber Trade Tennis Tournament.—First prize, two silver cups presented by Mr. Arthur Lampard, Mr. A. A. Craigen and Mr. H. E. Mason ; second prize, two silver cups presented by the Mincing-lane Tea and Rubber Share Brokers' Association, Mr. H. M. E. von Berg and Mr. A. G. von Berg.

President's Trophy....North British Rubber Co., (Ltd.,) Castle Mills, Edinburgh.

Special Silver Bowl, presented by the Exhibition. Leyland and Birmingham Rubber Co., (Ltd.,) 26, Duke Street, Aldgate, E.

Special Silver Cup, presented by the Exhibition. Harburg and Vienna Rubber Co., 1—3, Golden-lane, E. C.

MINCING-LANE TEA AND RUBBER SHARE BROKERS' ASSOCIATION PRIZE for the best suggestion for new uses for plantation rubber. Morland M. Dessau, Constad Works, Lower Edmonton, N.

"INDIA RUBBER WORLD," OF NEW YORK, SILVER CUP for the best system of coagulating plantation Hevea.—Dr. Carlos de Cerqupeira Pinto, Pará, Brazil.

"INDIA RUBBER JOURNAL" COMPETITIONS.—"Rubber Estate Photographs": Cash prize, £25, H. F. Macmillan, Department of Agriculture, Peradeniya, Ceylon. "Ideal Rubber Estate": Cash prize, £25, Leonard Smith, Kapar,Selangor, F. M. S.

"RUBBER WORLD" Competition.—Silver cup for the best essay, "What is an Ideal Rubber Estate", T. Clifton Hutchings, State of Kelantan; silver salver, J. McNicol, Tasarg Estate, Kuala-Nal, Kelantan.

WEST INDIA COMMITTEE COMPETITION.—Silver cup, Hill's Plantation.

"TROPICAL LIFE,' COMPETITIONS.—Competiton No. 1 (Ceará): Gold medal, W. Egerton, Coorg Coffee Company's Estates, Coorg, Southern India.

"GUMMIWELT" (HANOVER) COMPETITION.—Gold medal, Harburger Eisenund Bronzewerke A-G Garburg a/Elbe, Germany.

The comparative abstract statement of exports from the subordinate ports of the Madras Presidency to foreign countries for June tells a tale of steady expansion. I append a statement quoting the exports which exceeded a lakh in value:—

		1913. Rs.	1914. Rs.
Coffee	...	68,740	3,04,884
Coir	...	3,52,942	3,08,316
Copra	..	5,97,421	4,48,365
Cotton	...	29,86,042	42,93,694
Dyed Cloth	...	1,71,582	2,38,422
Grain and Pulse	...	21,36,159	24,41,113
Oils excluding ground-nut	...	1,65,022	1,02,353
Oil-cake	...	3,46,083	4,60,742
Ground-nut seed	...	18,47,250	13,82,980
Other seeds	...	1,35,300	1,75,627
Tea	...	10,73,938	12,55,243
Tobacco and Cigars	...	1,04,644	1,67,183

The total result is an export to foreign countries during June of goods to the value of Rs. 1,21,80,889 from the subordinate ports, against Rs. 1,03,87,273 in 1913, an increase of Rs. 17,93,616. For years no extension of railways has occurred in the Madras Presidency. And yet we complain that our rate of trade expansion is slow.—*Capital.*

FRANCE (FRENCH GUIANA)

Increase of Import Duty on Coffee and Tea.—The French "Journal Officiel" for the 17th June, contains a Presidential Decree, dated the 8th June, in virtue of which the Customs duties on coffee and tea of foreign origin imported into French Guiana, which were formerly fixed at one-half of the rates prescribed by the French Metropolitan Customs Tariff, are in future to be levied at the full rates prescribed by that Tariff.—*The Board of Trade Journal.*

LORRIES.

Motor Lorry Trials.

During April and May of this year trials were carried out by the Mechanical Transport Committee of the War Office in England of various types of Motor Lorries.

Practically all the great military Powers of Europe regard a subsidy as being the only practical way of obtaining the motor vehicles required in time of war, the exceptions being Italy and Russia, whose industries or roads are such that the civil population cannot employ sufficient vehicles in peace time to enable a war reserve to be maintained. The sum paid by the Government for subsidies depends largely on the state of the industry in each particular country, and where the number of vehicles is large in proportion to that required for war the subsidy need not be great. In Great Britain the actual subsidy paid is £110 per vehicle, of which £30 is paid on enrolment, and £80 in half-yearly instalments. In the War Office scheme considerable latitude as regards bodies is allowed, the only points insisted upon being provision for end-loading and sides at least 2 ft. high. Subsidies are only paid for vehicles of which a prototype has passed successfully through a War Office trial and obtained a certificate.

The trials began on 22nd April and five Firms each submitted one car of the three-ton class. The Firms were, Commercial Cars, Ltd., Messrs. Dennis Bros, Ltd,, Leyland Motors, Ltd., Mandalay Motors, Ltd. and Messrs. J. J. Thornycraft & Co., Ltd. The trials included a run of 1,500 miles at an average speed of not less than 12 miles an hour on hilly routes, over a period of 21 running days. The trial was a very thorough one and the cars were turned aside off the main route whenever an opportunity offered of taking them up a hill. A particularly awkward and sharp lane was found between Godstone and Caterham and on Pebblecombe near Betchworth the cars were asked to take the one in six gradient not only forwards but backwards to ensure that they could go up on the reverse as well as on the lowest speed. The gross weight of the laden lorry with three men on the driver's seat is $7\frac{1}{2}$ tons.

In addition to the weight and speed trials tests of reliability were applied, great importance being attached to accessibility, condition after the trials, quality of materials, finish and workmanship, handiness and ease of control, silence, cleanliness and springing.

The War Department points out that the three-ton lorries could really be designated four-ton vehicles, and now that a spare contact breaker is accepted in lieu of a spare magneto, and £30 of the subsidy is paid on enrolment, it would seem that the subsidy models would cost an owner no more than a non-subsidy model, or so little more that the first instalment received would repay any increased initial outlay.

Before certificates are granted the authorities require to be satisfied by the inspectors and the Army Service Corps officers, who have been riding with the drivers, that at least eight-tenths of the runs have been done at not less than twelve miles an hour on main routes and ten miles an hour on hilly routes; that at least half the runs have been non-stops, and not more than 200 marks have been deducted for lack of reliability; that not more than one gallon of petrol has been used per fifty gross ton miles; that the test hills have been climbed without stops; that the lorries, with a full load, have started from rest on a gradient of one in six, on which the foot and

side brakes have separately held them, and that in respect to such matters as accessibility, handiness and ease of control, general condition, quality of material and finish and workmanship, the reports are very good.

Upon a certificate being granted the purchasers of all vehicles of the type passed will receive from the Government £30 on enrolment and a further £80 in six half-yearly instalments, the only obligation being to sell the wagon to the War Office at a fixed price in case of national emergency.

Taken all through, there were remarkably few stops on the road, and very few repairs were required in the garage at night. Most of the road stops were due to such causes as failure of petrol supply on hills, or to water coming out from the radiators, with the resulting overheating, and were not due to break-down of a serious nature. In fact, it may be said that no vital part of any vehicle was seriously damaged during this trial.

The average fuel consumption was very good, but the good state of the roads was in favour of economical running. The average result of all the entrants was 54 gross ton miles per gallon for the whole trial. The best result over a shorter distance of about 200 miles run was 63 g. t. m. per gallon. The previous best results were 59 g. t. m. per gallon for a whole trial by one vehicle, and 68 g. t. m. per gallon for a 200-mile run; although considerably better results than this have been obtained on the acceptance tests of new vehicles of W. D. pattern.

At the close of the trials all the lorries were taken to Aldershot for a final examination, there being taken to pieces and the parts minutely inspected for defects.

As a final result of this inspection and the trials generally the following Firms were granted certificates:—

Commercial Cars (Ltd.) Class A. lorry.

Dennis Brothers. Class A.. lorry. Subject to tests of improved type of engine being carried out to the satisfaction of the War Department.

Leyland Motors (Ltd.) Class A. lorry.

The question of granting a certificate to another firm is still under consideration.

From the experience gained during the trials it does not appear that it will be necessary to make any serious alterations to the specifications. One small point as regards the interchangeability of radiators has arisen, and it will be necessary to specify the maximum depth of the lower channel of the radiator so as to make sure it does not foul the frame, as at present there is some possibility of its doing so.

R. D. A.

FRANCE (MADAGASCAR AND DEPENDENCIES).

Increase of Import Duty on Tea and Pimento.—The French "Journal Officiel" for the 17th June, contains a Presidential Decree, dated the 8th June, by which it is provided that Customs duty is to be levied at the rate fixed in the French Metropolitan Customs Tariff (*viz.* 208 francs per 100 kilogs.) on tea and pimento of foreign origin imported into Madagascar and its Dependencies, instead of at the rate of 104 francs per 100 kilogs.—*The Board of Trade Journal.*

CORRESPONDENCE.

August 12, 1914.

The Secretary,

United Planters' Association,

Connemara Hotel,

Madras.

Dear Sir,—I wired you to-day "Regret cannot attend Meeting writing you Connemara Madras," which I now confirm.

I should have liked to attend the proposed meeting but have only yesterday returned from Coonoor and have a lot of work to do.

I trust that I shall be favoured with a resume of what is done with the banks with regard to the present situation which is I am afraid a terribly serious matter with most private proprietors.

Speaking as a small proprietor of tea I would be glad if you would bring the following suggestion up for discussion and if it meets with support take necessary action.

It seems to me that even if the war is of short duration and goes entirely in our favour there must be a great slump in tea prices owing to the decreased purchasing power of the world.

I need only point out that if the public reduce their purchases by a pound a head that the market will be over supplied.

My suggestion is that tea producers should offer immediately to send to Russia a free gift of tea for the use of her Army. I would like to see this amount to a cess per acre in plucking of say 2 - 5 lbs.

It would be necessary to work this through the Government as the tea should be admitted into Russia free of duty. I need hardly point out that Russia is essentially a tea drinking country and that beyond all questions of sentiment this gift would be a fine advertisement and the weight of tea taken off the market would in all probability have some effect on the selling price.

I have forwarded a copy of this to Mr. Richardson in the hope that the idea will find acceptance with him and that he will interest himself in the matter.

I have only finally to point out that if this or other is taken up it has to be AT ONCE.

Yours faithfully,

(Signed) A. H. MEAD.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED)

Contents.

The Barometer remains unchanged nor can we expect any improvement until matters are more settled.

We publish an appeal for support from all our subscribers. We commend this Relief Fund. It is only just that those who go to fight our battles and uphold the honour of the Empire should be relieved of all anxiety on behalf of those they leave behind. Probably local branches have already been started to which our readers will find it more convenient to subscribe, but we should like, in the name of the United Planters' Association, to be able to remit a large sum under one heading.

An interesting article on Coffee Cultivation in Uganda is published. The description varies a little from that in use in Mysore and Coorg.

From *Capital* we extract an article on the Planting of Albizzias in Tea, and an account is given of the several varieties.

In *The Rubber World* the Roadway of the Future in the old Kent Road is described, and was inspected and approved of. Should the use of rubber in streets become universal there will be but little fear of over-production.

An interesting article describing Insect Pests in Malaya, and some methods of controlling them is extracted from the Review of Applied Entomology.

We have just had a letter from Mr. Aylmer Martin, who informs us that Mr. Day, the Deputy Director, has been unavoidably detained for a fortnight, and will arrive in Coimbatore about 15th September; and that he himself will come out by the P. and O. "Nyassa" leaving London on the 29th August, and will be in Bangalore about October 1st.

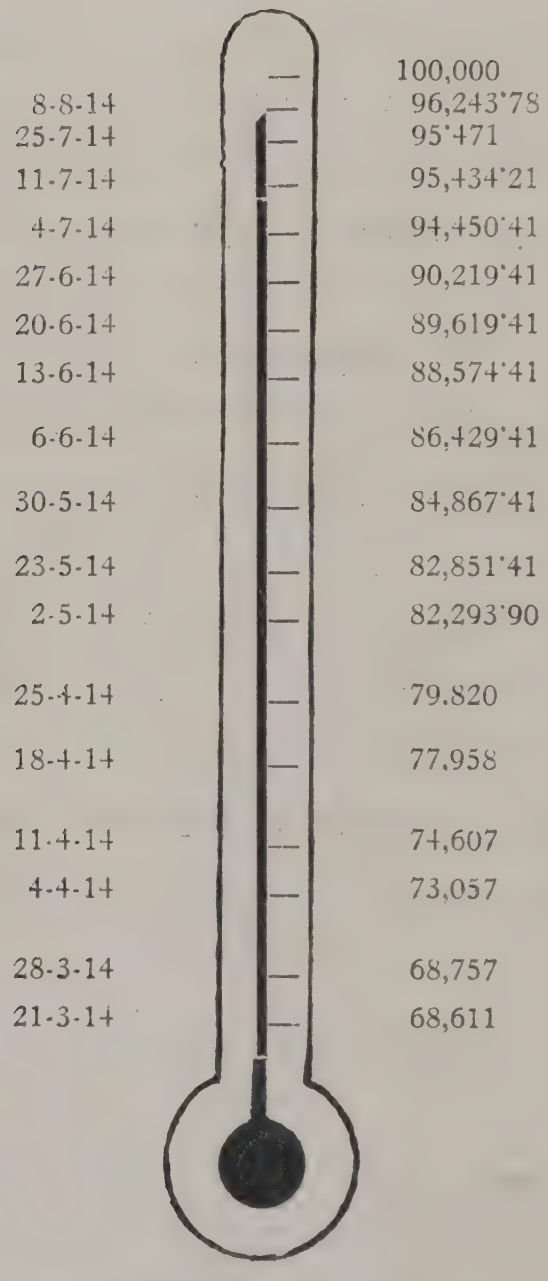
Mr. Anstead writes he still hopes to be back by the 20th September, unless the sailing of his boat is cancelled.

In the Coorg Planters' Association Proceedings last week the last sentence relating to the Scientific Department should read "Provided that other Associations also subscribe in the *same* proportion" and not "some."

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

RELIEF FUND.

We publish below a circular that has been sent to us by the First Assistant Resident to the Resident of Mysore together with a report of the first meeting in Bangalore of the Imperial Indian Relief Fund and a strong representative local Committee has been formed to raise funds for this most laudable purpose. We ourselves are strongly of opinion that this Fund should be supported by all the Planting Community in preference to any other Fund.

It is common knowledge that Indian Divisions, both European and Indian Troops, are and will be employed in this war, and that troops have already left India to take their part in upholding the Empire. The Viceroy in his appeal says "There will be distress among the families of those who are going from India to the war, and unhappily there may be destitute widows and orphans as a result of the war. The need for large funds is therefore urgent and it is desirable that steps should be taken without delay to collect them." All of us were prepared to subscribe to the Prince of Wales Relief Fund but under the altered aspect, we appeal to intending subscribers to subscribe to the Imperial Indian Relief Fund. No Indian subscription should be diverted but all flow into one channel, thereby increasing its volume and utility. It may be, and most probably will be, that volunteers from the Planting Community will go to the front as they did in the Boer War, and charity should begin at home, and those whom we know so well should benefit by our subscriptions. Even if they do not, it is only reasonable that those who are leaving India's shores, in all our interests, should benefit by the Imperial Indian Relief Fund.

We place our services at the disposal of the Planting Community to receive and remit subscriptions to the Branch of the Imperial Relief Fund in Bangalore. We suggest this as the best method of supporting the Relief Fund of the Expeditionary Forces from India, though it should not, if intending subscribers wish it prevent them sending their money to any Branch of the same Fund in their vicinity.

IMPERIAL INDIAN RELIEF FUND.

The public are generally aware that, with the full approval of His Majesty the King Emperor, His Excellency the Viceroy has inaugurated a fund to be styled the Imperial Indian Relief Fund, which will correspond to the Prince of Wales' Fund in Great Britain and is intended for the relief of all kinds of distress in India resulting from the War.

His Excellency's Appeal opened as follows :--

"War has been forced upon the British Empire and an Expeditionary Force from India is being prepared to take its place in the defence of the Empire across the seas. The Force will be a large one and will include a very considerable number of our brave Indian regiments as well some of the Imperial Service Troops from the Native States. There will be distress among the families of those who are going from India to the war and unhappily there may be destitute widows and orphans as a result of the war. The need for large funds is therefore urgent and it is desirable that steps should be taken without delay to collect them."

His Excellency then explained that he would himself preside over a Central Committee, which would include most of the principal officials and many of the leading Chiefs of India; and that, under this central control, there would be formed an Executive Committee and Local Branches.

2. In response to this appeal and with the hearty concurrence of His Highness the Maharaja of Mysore, who is a member of the Central Committee, the Resident and Chief Commissioner, with the kind co-operation of the leading gentlemen of Bangalore, has taken the necessary steps for the formation of a local branch of the Fund, to be styled "The Mysore and Coorg Branch of the Imperial Indian Relief Fund." The Branch Committee, which has power to add to its numbers, is for the present constituted as under :—

President.—Lt.-Colonel Sir H. Daly, K.C.I.E., C.S.I.

Vice-Presidents.—The Dewan of Mysore, the General Commanding, Bangalore Brigade, and the Commissioner of Coorg.

MEMBERS.

Khan Bahadur Abdul Rahman.
Rao Bahadur Annaswami Mudaliar.
P. A. Barton, Esq,
A. R. Cox, Esq., I. C. S.
Mir Humza Hussain, Esq.
M. Kantaraj Urs, Esq., C. S. I.
Sir Leslie Miller, Kt.
H. V. Nanjundayya, Esq., C. I. E.
Dewan Bahadur K. P. Puttanna Chetty.
Colonel A. E. Tate.

Joint Honorary Secretaries.—P. B. Warburton, Esq., First Assistant Resident and Secretary for Coorg, and Mirza Mahomed Ismail, Esq., Huzur Secretary to H. H. the Maharaja.

Honorary Treasurer.—H. N. Collyer, Esq., Agent, Bank of Madras, Bangalore.

3. The Commissioner of Coorg, the Deputy Commissioners of Districts in Mysore, and the Presidents of the Municipalities of Bangalore and Mysore cities, have been invited to form Sub-Committees. A Sub-Committee for the Civil and Military Station of Bangalore was constituted at a public meeting on the 22nd instant.

4. The Branch Committee feel certain that the public of Mysore and Coorg will respond with alacrity to the call of His Excellency the Viceroy, which was thus expressed :—

"I appeal with confidence to the Ruling Chiefs, Nobles, Merchants, and People of India, both European and Indian, to come forward each according to their means and to help to alleviate distress of all kinds due to the war, and especially the distress and suffering that war must necessarily entail upon the families and dependents of those who will be braving death and enduring hardships for the safety and common interests of the Empire."

5. Subscriptions should be marked "Mysore and Coorg Branch, Imperial Indian Relief Fund" and may be paid (i) directly into the Bank of Madras at the Bangalore branch, (ii) to either of the Joint Honorary Secretaries of the Branch Committee, or (iii) to any Secretary of a Sub-Committee. Lists of the subscriptions received will be published periodically in the local newspapers and will be duly communicated to Major John Mackenzie Comptroller of the Viceroy's Household, and one of the Honorary Secretaries to the Central Committee of the Fund.

6. Should further information be desired in regard to the Fund, any member of the Branch Committee or of the Sub-Committees will be happy to reply to enquiries.

GOD SAVE THE KING.

COFFEE.

Coffee Cultivation in Uganda.

By W. Small, M. A., B. Sc.,
Botanist, Department of Agriculture, Uganda.

Coffee is the staple crop of European planters in Uganda. Six years ago the amount exported was only 194 cwts., valued at £194; but during 1912-13 the amount rose to 3,336 cwts. and value to £8,940. The area under coffee at the end of March 1913, was 4,568 acres, and under coffee and rubber 2,659 acres. In spite of the rapid progress thus made the area under coffee is still being extended, and the value of the exports during the nine months ended December 31, 1913, was £16,852. This large increase is due to coffee estates coming into bearing for the first time during 1913. Other estates have not yet begun to bear, so that a further large increase in the amount and value of coffee exported may be confidently looked for in each of the next few years.

It is a question whether the maximum output when once attained will be maintained over a large number of years. Among the factors governing the future of the industry the chief will be the prevalence or scarcity of diseases and pests, and the amount of success achieved with other Uganda crops, such as cocoa and rubber. Cotton growing is almost entirely in native hands, and is not in favour with European planters; at present the possibility of Uganda following the example of Nyasaland, and making a success of cotton planting under European management, seems remote.

Varieties of Coffee in Uganda.

The indigenous coffee of Uganda is *Coffea robusta*. It occurs throughout the Kingdom of Uganda and certain other parts singly or in groups of from three to twelve trees, and though, to all appearances, it grows well and bears heavy crops, it is capable of improvement by good cultivation. These indigenous trees are usually heavily shaded by bananas, bark-cloth trees, and the like, and leaf disease (*Hemileia vastatrix*, B., and Br.) is rife. The native owner pays no attention to the trees beyond picking the ripe berries. The produce is consumed locally. This "native" coffee was grown originally in specially cleared strips of forest, and the largest output came from the Ses Islands, a group in Lake Victoria (Victoria Nyanza), visible on the horizon from the shores of the Kingdom of Uganda. It was only when the natives realised that this coffee was of economic value that they planted it in their own gardens as it is found at the present day.

The coffee cultivated by Europeans in Uganda is of two kinds "Nyasaland" and "Bourbon." It is said that the "Bourbon" sort came from Aden, *via* the Ile de Bourbon, to East Africa, transported thence by French missionaries, and that the "Nyasaland" coffee was derived from the "Blue Mountain" coffee of Jamaica, introduced into Nyasaland and thence into Uganda some dozen years ago. If credence can be given to these statements, but these coffees are to be regarded as derived from *Coffea arabica*, L.

Little care has been taken as regards seed-selection; much inferior seed has been planted, and in some areas inequalities of growth are very noticeable. The demand for seed, caused by the recent opening-up of new land, was met by local supplies from the older plantations, particularly from those in the hands of the missionaries, who did valuable pioneering work.

Both "Bourbon" and "Nyassaland" sorts of coffee thrive well in Uganda, and give heavy crops in the fourth year.

The outbreak of coffee-leaf disease at the end of 1912, and the epidemic during the rainy season, March—May of 1913, led planters to give some attention to other kinds of coffee. *C. liberica*, Hiern, is not immune to leaf disease, and it is doubtful whether it will thrive in Uganda. Its product is inferior to that of Arabian coffee. Moreover, it requires a rich soil, a hot, moist atmosphere, and a lower elevation than that obtaining in this country. Plants of *C. liberica* and *C. stenophylla*, G. Don, are being raised by the Department of Agriculture from seed imported from West Africa, and their progress will be watched with interest. A few acres have been planted with *C. robusta*; but enthusiasm for it is lacking, and it is very unlikely that it will ever become a favourite crop.

Climate, Soil and Situation.

The Uganda Protectorate is situated within the zone usually regarded as providing the best conditions for coffee-culture. The climate and soil are matters of primary importance, and in both of these respects the conditions in Uganda are favourable. There is much rich, deap soil of free texture which is very suitable for coffee. Potash is an essential constituent of a good coffee soil and it is present where forest has been felled, or where the grass-land, so common in this Protectorate, has been cleared. Coffee land should be well drained, and stagnation of soil-water is as undesirable for coffee as is a stiff clay subsoil. The contours of the planting districts in Uganda favour easy drainage, for gentle slopes are more usual than steep declivities, and flat, swampy land can always be avoided. Similarly, the intending planter should keep clear of excessively humid or excessively dry areas. A long, dry season is very trying to coffee plants, and a wet atmosphere, due to excessive rainfall or the nearness of marshy places, results in the production of luxurious growths of wood and foliage, to the detriment of the crop. Well-established coffee, however, does stand a considerable degree of heat, so long as it has sufficient moisture. It must be remembered also that a sufficient elevation will render temperate a region which is situated on the Equator itself. This is often the case in Uganda, and, on the whole, the climate, elevation, and general conditions are eminently suitable for coffee cultivation.

As has been said, gradual slopes are a feature of the areas already devoted to coffee-planting in Uganda. The most suitable areas are those which are free from sour material and possess sufficient incline not to retain an excess of moisture, and are yet not steep enough to allow heavy rain to denude the land of its valuable surface soil. In many cases the action of natural forces has formed at the base of a slope, or on its lower parts, an accumulation of soil which is permanent, and contains much organic matter produced by the decay of vegetation from the surrounding hills.

Heavy forest land is not usual in the planting districts, but where it does occur—for example, in occasional patches in hollows it can be thinned and retained as a field or nursery shade. Most of the land acquired for coffee estates bears "elephant grass" (*Pennisetum purpureum*, Schum.), which grows thickly, and often to a height of over 12-15 ft. The clearing of such land consists in cutting and burning the grass, turning over the soil to expose and kill the grass-roots, and finally, removal of the debris.

Manures.

It is unlikely that the good coffee land of Uganda will require to be manured for some years to come for the sole purpose of supplying to an exhausted soil the elements it requires. In parts, trees suffer because of denudation of slopes, and in such cases the application of manure, combined with efforts to replace lost soil and to prevent further loss, is effective. At present all that is needed in the Uganda plantations is that treatment should aim at providing the trees at the proper time with such a stimulus as will enable them to carry through the wet season, with its dangers of the spread of *Hemileia* disease, and through the dry season with its dangers of drought and defoliation. Animal dung is so scarce as to be negligible as a manure, and the price of artificial manures is prohibitive. Planters are therefore compelled to use green manures and vegetable refuse such as coffee pulp. Mulching could be advantageously practised to a much greater extent than is yet the case.

Sowing and Planting.

For sowing purposes, only the largest and finest fruits from the healthiest trees should be chosen. After hand-pulping and sundrying the seeds are sown in rows in beds laid down on gently sloping virgin soil, which has been thoroughly dug and prepared. Sowing by scattering has been practised, but this method leads to a waste of seed and of space. Coffee seedlings have been raised without shade or watering, but it is more usual to have them shaded and watered, and to harden them off, as the time for planting-out comes on, by removing the shade and reducing the water supply. Sowing at stake has not been tried; it avoids the risk and expense of transplanting, but it exposses the young plants to the dangers of heat and drought, and is expensive because of the necessity for continued clean-weeding. Blanks are supplied by potted plants from the nursery

Lining presents no difficulties except those due to unevenness of ground. The size of the holes varies with the soil. Some planters standardise their holing by using a kerosene tin, fitted with a handle for convenience, as a gauge of size, the hole being made large enough to allow of the tin being turned round in it.

Planting-out is a critical operation, but the planter who organises his labour for the various parts of the process and endeavours to make his men realise the importance of their work, will have few losses, provided that he is fairly fortunate in weather conditions. A little temporary shade is always advisable for newly planted coffee. It is usually made with the leaves of a palm, *Phoenix reclinata*, Jacq. (native name "nkindu.")

Planting distances should vary according to the quality of the soil, the exposure, and the presence or absence of insect pests and fungoid diseases. Allowance should be made for growth and facility of cultural and other operations. Planting has been too close in several cases. The presence of coffee-leaf disease and the consequent necessity for spraying operations have modified opinion to some extent, and, although 8 x 6 ft. is a favourite spacing it seems best to plant at least 8 x 8 ft. as a general rule. Triangular planting is rarely found in Uganda. Its advantages are purely theoretical, and the arrangement interferes with inspection and the apportionment of tasks.

Shade Trees and Wind Belts.

The question of permanent shade for coffee in Uganda is an unsettled one. Perhaps it is more correct to say that the coffee-growing industry of

the country is yet too young to allow of any definite deduction from experience as to whether shade is necessary or unnecessary. Shading has not been given a fair trial, though a few experiments have been made. The results of these were, on the whole, unsatisfactory, possibly because the shade was of too heavy a nature and of such materials as inhibited the circulation of air about the plants, particularly during the night, when the atmosphere is apt to be moist. Shade is advisable on slopes where heavy tropical rains cause erosion and denudation, and it would prove advantageous on wet soils. Its cover aids decay of vegetable matter on the surface, and leguminous shade trees enrich the soil. On the other hand, shade is conducive to a diminished yield and to dampness, and in order to be a protection against infection by *Hemileia* disease by wind-borne spores, it would require to be so heavy as to interfere seriously with yield and with the movement of the air. It cannot be regarded as a direct protection against *Hemileia* infection; its benefits in this respect are indirect in so far as its presence will induce a vigorous condition of the shaded plant. Further, shade requires to be carefully regulated, and the expense entailed would probably be out of proportion to the benefits afforded. On the whole, lack of experience precludes the statement of a definite opinion at this stage, but it is strongly felt that shade for Uganda coffee is worth an extended trial. The silky oak, *Grevillea robusta*, A. Cunn., is being experimented with for this purpose, and various species of leguminous trees would be suitable. Pará rubber trees are used as shade on several estates. They have the advantage of being profitable and the disadvantage of being subject to a root disease (*Hymenochoete noxia*, Berk.) which occurs also on coffee. Cases of this disease have occurred in Uganda, but not frequently, on both coffee and *Hevea*.

Owing to the situation of Uganda, the question of exposure to sunshine is a simpler one than that of exposure to winds. The latter demands consideration. In parts, *e. g.*, those near Lake Victoria, strong, steady winds occur at certain times. In some cases they have blasted the exposed trees on one side, and even so loosened them in the soil as to cause eventual death. Remedial measures, however, can be adopted in such cases.

There is no lack of suitable trees for either a high or low wind-belt. Bananas are extensively used. They grow thickly, and they provide food for the native labour staff. Only one indigenous tree (*Dolichandrone platycalyx*, Baker), occasionally used in this connection, is known to harbour coffee pests.

Weeding and Cover Crops.

In several cases weeding has proved an expensive item in estate management. Conditions very often favour the rapid growth of weeds, and lead to their becoming a more or less temporary menace to coffee cultivation, but the real source of expense and trouble lies in the lack of thorough initial clearing and the continuance of operations on scientific lines. Hand-weeding with forks is the most efficient method of procedure. Cover-crops are not much in favour. The remarks made concerning shade apply to cover-crops, and the Department of Agriculture is making trials with various plants.

Pruning.

Good pruning enables the trees to bear better crops, and tends to lessen the dangers and effects of leaf disease. Unpruned trees become thickly-entangled masses of branches and leaves, and the chambers so formed about the trunks are a series of forcing-houses for the development of *Hemileia* spores. The planter should never be afraid of sacrificing a

portion of his crop. By pruning he will strengthen his trees, prolong their lives, and ease the labours of subsequent years. The difficulties in the way of accomplishing the pruning of a large estate are great. Chief among them are expense and labour, but that they are not insurmountable has been proved.

Pests and Diseases.

The "Bourbon' and "Nyasaland" varieties of coffee are, unfortunately, rather susceptible to *Hemileia* disease. The recent virulence of the attack may be explained on the assumption that the parasite, endemic in the country, suddenly found itself in the midst of a generous supply of fresh hosts owing to the rapid planting up of large areas of coffee. Its attack was able to assume epidemic proportions unchecked. Despite the prevalence of this disease, the outlook is favourable, for the indications are that its virulence will be less in the future than in the past. Planters are recognising that much depends on their efforts to eradicate it, and the Department of Agriculture is alive to the situation. The fungus, being endemic in Uganda, cannot be expected to work the havoc that it was wrought in other countries into which it was introduced.

Exterminators have been used with success in dealing with those common tropical pests "white ants" (*Termites*). Their ravages are much greater in certain districts than in others, while in some parts, they have caused little or no damage to growing plants. Their presence is a danger, the gravity of which is not recognised by all concerned, and against which provision should be made.

Harvesting and Preparation of the Berries.

Native labourers can pick the coffee crop efficiently after a little instruction, and many estates are now erecting machinery for pulping and drying coffee. Fermentation is done in tanks, and the first part of the drying process is accomplished by spreading the beans on wire trays in the sun. Climatic conditions often interfere with the sun-drying process, for harvesting takes place during the wet season. A hulling and sizing factory is about to be established in Kampala, the commercial capital of Uganda. Such work is best left to those who make a speciality of it.

Good prices have been obtained under conditions far from perfect, and the gathering of experience and subsequent improvements in methods should in time raise the standard of quality of Uganda coffee. In the meantime, the prospects of the industry cannot be regarded as other than bright.

(*Note by Editor.*—In view of the promising condition of coffee cultivation in Uganda described by Mr. Small, reference may be made to a report on plantation coffees from Uganda published in this *Bulletin* two years ago (1912. 10, 397). The results of the examination of these coffees in the Scientific and Technical Department of the Imperial Institute showed that they were of very promising quality, being valued at 70*s.* to 72*s.* per cwt., with Nyasaland coffee at 76*s.* to 82*s.*, and Central American coffees at 77*s.* to 85*s.*

Such defects as the Uganda coffees exhibited were those due to inexperience in preparing the beans for the market. Recommendations for avoiding these defects were made, and it was pointed out that with more experience an excellent quality of coffee should be produced by the Uganda planters.)—*Bulletin of the Imperial Institute.*

TEA.

Albizzias in Tea.

The practice of planting some leguminous trees among tea has long been recognised as beneficial to the production of a good crop. But there is much divergence of opinion as to the actual influence they exercise upon the soil and the tea plants. Careful observations and cultural experiments have now resulted in establishing beyond question that these leguminous trees develop nodular growths on their root system which contain bacteria that can fix the nitrogen of the air and by supplying this most valuable constituent to the soil enrich it to an appreciable extent. Their taproots moreover penetrate into deeper substrata than the tea plants can ever reach and thus make them more porous with the result that larger food supplies are available for the tea plant than would otherwise have been. Where opinion are likely most to differ is about the effect of the light shade that small leaved trees like the San (*Albizzia-stipulata*) or the Medeloa (*Dalbergia assamica*) can provide. Without entering into any discussion upon this contentious point the fact remains that both the above trees have been largely adopted in the tea gardens and generally the results have been good. This may be said to be particularly true of the San (*Albizzia-stipulata*).

Hence has arisen the question, as a necessary corollary, whether other members of the family may not be tried with equal advantage to tea. There are several species of this genus that appear, both in their habits and characters, to be near allies of the San and thus deserving of attention for practical experiments.

(1.) *Albizzia odoratisima.*—The Korai—or more strictly speaking the Jati-Korai. The leaflets of this tree are somewhat thicker and broader than those of the San, but they are deciduous or fall off very early. Sir George Watt and Dr. Mann, in the second edition of their report on Tea, have spoken rather slightly of this tree and it has never been received in favour by the tea planting community. But so far no direct evidence has been adduced why it should be considered as inferior to the latter. It is indigenous in the plains at the foot of the Central Himalayas, and it should thrive well in the tea districts.

(2) The second is *Albizzia mollis*—a tree indigenous in the Indo-gangetic plains extending from the Punjab to the extreme boundaries of Nepal. This tree had formerly been associated with *A. julibrissin* as a variety of it. But recent investigations have served to establish that *A. julibrissin* is not an Indian species and that the plants hitherto recognised under that name in Indian Herbaria partly belong to *A. stipulata* and partly to *A. mollis*. This species may be easily distinguished by its thick leaflets softly felted beneath and the flowers with pink filaments which have given to it the vernacular name of Lal Siris.

(3.) The third is Safed Siris or *Albizzia procer* . It is occasionally to be met with in the tea gardens. Sir George Watt and Dr. Mann remark of it that on the Hills it has often proved superior to the San. It is a species with round and obtuse leaflets and occurs throughout the Central and Eastern Himalayas and has sometimes been confounded with Medelsa which it resembles in appearance. It is to be found in fairly large numbers in Bengal and Bihar and reproduces easily.

(4) The fourth is a little known species which is believed to be confined in Burma. It very closely resembles *A. Stipulata* in almost every single

character. It has in fact been separated from that species by Sir David Prain under the name of *Albizzia lebbekoides, Bth.*

The last is *Albizzia moluccana.* It is not strictly an Indian species but has been freely grown for years in parts of India. Some years ago, it was very largely adopted as a shade tree for coffee in South India. But its rapid growth into enormous sizes has rather militated against its extended use in the coffee estates. It is, however, reported to be doing fairly well with tea in some of the tea estates in the Duars. This objection urged against it does not seem to materially affect tea. But even if it did, scientific treatment and rational methods of pruning would be found very effective remedies.

The best system of working with these leguminous trees would perhaps be in cutting the trees down after a certain period of growth, say 5—6 years, and in gradually replacing them by saplings in lots of ranging growths of 1—3 years.—H. C. B.—*Capital.*

The Roadway of the Future.

Mr. M. M. Dessau's rubber roadway in the Old Kent Road was inspected and tested a few days ago by a number of planters, manufacturers and surveyors, and the verdict is entirely in its favour for the reasons we gave last week. It is to be hoped that his efforts will be supported by the public authorities and the producers with the energy and cordiality they deserve. The Rubber Growers' Association has made a beginning, though the general feeling is that it has not gone far enough. A company to be called Rubber Developments, Limited, is proposed, with a capital of £30,000 and an appeal is to be made to the plantation companies for subsidies in kind. They are to be asked to contribute annually for five years a quantity of rubber equal to one-fifth of 1 per cent. of their output for the twelve months ended June, 30th, free of cost, and an equal quantity if called upon to do so at the price of 1s. per lb. For a scheme which means so much if it succeeds the demand strikes us as unduly modest. In the prospectus the R. G. A. says:—"It is believed that rubber is the most perfect substance for street-paving, and will become an essential factor in the construction of durable roads of the highest class, A first and pressing necessity is for a co-operative organisation able to demonstrate this in a manner that will not only satisfy the authorities responsible for the streets of London, but also the public, who will then come to insist on its provision. It is only by proof on a practical and extensive scale that this end can be attained, but, once accomplished, there is little doubt that the leading cities of the world will demand rubber paving for, at any rate, some parts of their streets—an eventuality which, it is hardly necessary to say, would dissipate fears of over-production."—*The Rubber World.*

1914-1915 Coffee Crop Estimates.

The British Vice-Consul at Santos (Mr. R. A. Sandall) reports that, according to the "Diario Official de Sao Paulo" of 28th June, the Department of Agriculture estimates that the amount of the 1914-15 coffee crop which will reach Santos is 8,622,730 bags (of 60 kilogs.).—*Board of Trade Journal.*

INSECT PESTS.

In an account of agriculture in general in Malaya during the year 1912, reference is made to the insect pests of the various cultivated plants. Of the pests of rubber it is stated that on the whole no great damage was done, and that the rubber tree, *Hevea brasiliensis*, is generally only attacked by insects when it is weakened by bad treatment or fungus. A mealy-bug was found attacking rubber in Perak, but when the estate was visited, lady birds and lepidopterous larvae were found preying on the scale, and as no further damage has been reported, it is hoped that the pest is being held in check. Of termites, *Termes gestroi* was controlled by means of the "Universal White Ant Destroyer," which was also used with good results on colonies of *T. carbonarius* and *T. sulphureus*, termites that sometimes damage newly planted stumps. Against *Xylotrupes*, the fork-horned rhinoceros beetle, and *Brachytrypes*, the large cricket, the Carey system of truncated paper cones was found to be effective. *Xyleborus* sp., a small shot-hole borer, was found attacking full grown trees, but usually only where they had been weakened by too close planting or bad pruning. It is recommended that the system of lopping branches overhanging roads and railways be improved: the cuts should be clean, and made as near the trunk as possible the cut surface should be tarred. Those estates which have long stumps with hacked ends are sure to become sources of infection to their ..... neighbours. No cases of healthy trees being attacked by the borer have been recorded. Plant mites have caused some loss in rubber nurseries, but against these the lime-sulphur spray is usually effective.

Coconuts suffered very little from pests, no serious outbreaks being recorded. The caterpillars of *Brachartona catoxantha* attacked the coconut plantations in the vicinity of Batu Gajah; to prevent the spread of these insects, the Inspector of Coconuts had the trees for a time almost completely defoliated and the leaves burnt, leaving only those standing that were not affected. As some of the owners objected, and the Coconut Enactment does not contain provision for dealing with this pest, the process had to be arrested, giving the insect the chance of spreading to neighbouring holdings, which it soon did. At the close of the year the Inspector reported that the drastic treatment adopted at first was entirely successful, and that the foliage on the treated trees was exceptionally good, while 20 per cent. of them were again bearing. The untreated trees, he states, were far inferior in appearance. The final checking of the spread of the pest was accomplished by a parasitic Ichneumonid, which was found present in large numbers at the height of the outbreak. A number of trees were defoliated by two pests, the coconut skipper (*Hidari irava*) and the coconut bag-worm (a Psycind); both of these insects are subject to the attack of Ichneumons. A small Hispid beetle was received from Johore; it is a serious pest of coconuts in the Phillippines.

During the year one area of about 200 acres of young coconuts was defoliated by locusts (*Locusta danica*, *L*) on an estate in Negri Sembilan. The trees at the close of the year practically all showed signs of recovery. The locust first appeared prominently early in the year on grass-land near the West Coast of Negri Sembilan, whence it spread in the flying stage to Seremban and there started breeding. As a rule the insects were quite contented to feed on the lalang grass, and it was only where this had been cleaned up that they took to other plants, such as bamboo, Indian corn, sugar-cane, etc. Experiments are being carried out with a view to finding out the best methods of combating the pest, even although it is at present doing but little damage to any valuable crops—*The Review of Applied Entomology*.

CORDAGE FIBRES.

Sisal Hemp from the Federated Malay States.

A considerable number of samples of Sisal hemp from various countries have been examined at the Imperial Institute, and the results of examination of some of these have been published in previous numbers of this *Bulletin*. Among these may be mentioned samples from Rhodesia (1904, 2.168), Sierra Leone (1907, 5,107,) East Africa Protectorate, Uganda, and Nyasaland (1909, 7,160), Portuguese East Africa (1912, 10,131), Mauritius (1910, 8,9), India (1906, 4,25; 1909, 7,11; 1912, 10,216), and Papua (1912,10, 214).

The sample of Sisal hemp which is the subject of the present report was received at the Imperial Institute in September 1913. It was desired that the fibre should be examined and valued, and that its tensile strength, in particular; should be determined.

The sample consisted of lustrous fibre, fairly well cleaned and prepared, but of slightly uneven colour, varying from cream to brownish yellow, and generally considerably darker in tint than is usually the case with Sisal hemp. The length of staple varied from 2 ft. 6 in. to 8 ft,, with an average of 4 ft. 3 inches.

The fibre was submitted to chemical examination with the following results, compared with corresponding figures for a sample of Sisal hemp from the East Africa Protectorate.

	Present Sample.	Sisal hemp from the East Africa Protectorate.
	Per cent.	Per cent.
Moisture ...	12·0	11·1
Ash ...	0·8	1·0
A.-Hydrolysis, loss ...	11·3	11·2
B.-Hydrolysis, loss ...	20·1	14·1
Acid Purification, loss.	1·9	2·3
Cellulose ...	77·1	78·2

The length of the ultimate fibres varied from 0·06 to 0·29 inch, with an average of 0·19 inch.

The dark colour of the fibre as received at the Imperial Institute was found to be due to the presence of iron, which may have been derived either from the water used in washing or from the scraping instruments used in preparing the fibre. After removing this iron by the use of chemicals, the washed and dried fibre was of a light cream colour.

The fibre was also examined for tensile strength and elongation in comparison with a standard sample of Sisal hemp from East Africa. Using a length of 20 cm. of fibre for the tests, the following average results were obtained:

	Present sample.	Sisal hemp from East Africa.
Breaking stress in grams	618	1,102
Extension before breaking, per cent.	4·5	2·0

Taking the East African Sisal hemp as the standard, the ratios are as follows :

	Present sample.	Sisal hemp from East Africa.
Breaking stress ...	... 56	100
Extension ...	... 225	100

The above figures indicate that the present sample has only 56 per cent. of the strength of the East African Sisal hemp, but that it is 2½ times as extensible as the latter.

The fibre was submitted to a firm of merchants, who valued it at £25 per ton in London, with Mexican Sisal at £26 per ton (December 1913).

Fibre of this quality would be saleable in large quantities for cordage manufacture. A more valuable product could probably be obtained by extracting the leaves with modern machinery and brushing the fibre produced.—(*Bull. Imperial Institute.*)

Brazil to Borrow a Hundred Million More.

Brazil has been casting about for some time to see where she could borrow $100,000,000 to pay off some rather pressing matters. England has been Brazil's source of financial supply for a long time, but England already has over half a million dollars invested in one way and another in that country and apparently begins to feel rather conservative regarding further advances. Moreover, the Brazilian Government now has a foreign indebtedness of over four hundred million dollars, and last year its expenditures exceeded its income by over eleven millions. German financiers have been appealed to but have not proved particularly responsive.

It appears now, however, that this loan will be made, not by the financiers of any one country, but by an international group of bankers, probably about the same group as co-operated to assist China. It is stated that some of the large New York banking interests will participate in this Brazilian financing to the extent of twenty million dollars.

It is unfortunate that Brazil, with her vast wealth in rubber trees, not ten per cent. of which have probably yet been touched, and with her great coffee product and other wonderful resources, should be compelled to burden herself with debt.—*The India Rubber World.*

Prospective Re-establishment of Cotton growing in Australia.

The British Cotton Growing Association, in conjunction with the Queensland Department of Agriculture and the Commonwealth Government, has excellent hopes of the re-establishment of a cootton growing industry in Australia. Thirty years ago the East and West Moreton districts had over 14.000 acres under cotton, the cultivation of which has meanwhile dwindled, owing to adverse circumstances. In view, however, of needs of Lancashire and of the domestic industries of Australasia, the re-establishment of this cultivation is under consideration. The British Cotton Association has undertaken to guarantee a fixed minimum price of 6½d. (13.17c.) per pound for a period of three years. Skilled advice and suitable seed will be supplied to possible cultivators.—*The India Rubber World.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Labour Barometer remains in *statu quo*.

We publish the proceedings of the Wynaad Planters' Association. Mr. Abbott as Delegate to the last Annual Meeting read his report and we would call attention to his remarks on the Labour Department, which should lay at rest any doubts as to the future composition of the Committee.

The question of the Scientific Officer was fully and clearly explained by Mr. Abbott and full details will be seen in the Book of Proceedings, which is now in the Printers' hands.

We have written about the War Relief Fund, supporting the Imperial Indian Relief Fund, but we note that the Prince of Wales Relief Fund is being supported by some Associations, and we believe this was done before the Indian Relief Fund was started.

We continue reproducing the article from *Simmons Spice Mill* on the Commercial Aspect of Coffee which will be read with interest by all coffee planters

A correspondent "Dum-Dum" sends us an extract from the *Daily Mail*. Read by the light of Reuter's Telegram received this morning, it would be euphemistic to accord the adjective "honest" to it.

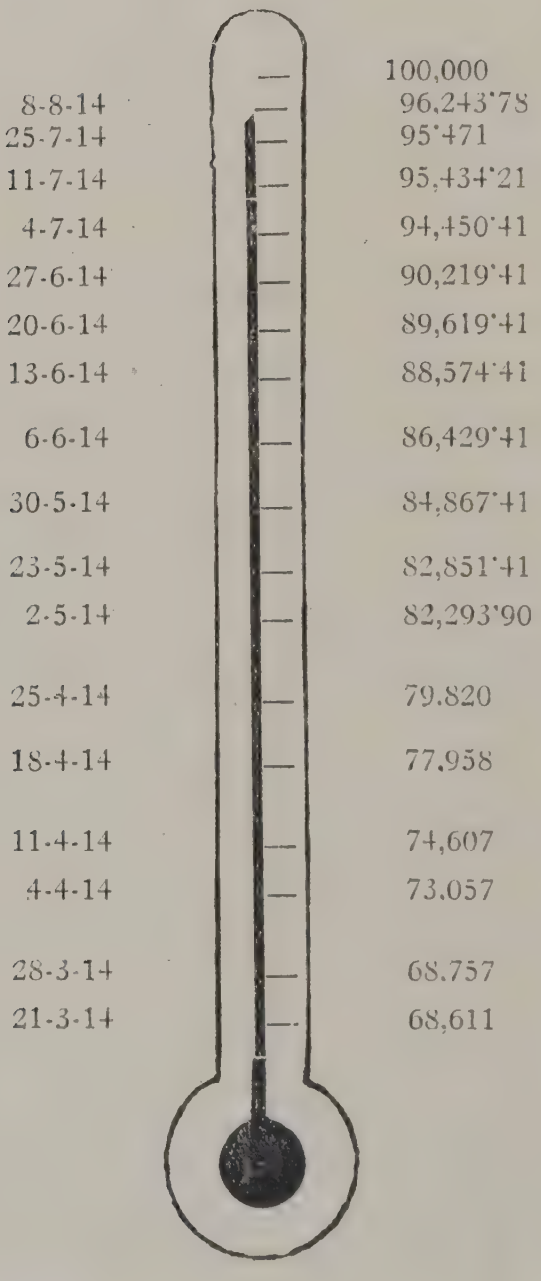
"The British Ambassador in Berlin described the movement of a powerful secret Association of manufacturers and shipowners for the purpose of influencing the Foreign Press particularly in South America and the Far East as a preparation for a vast system of International Blackmail."

In reply to a letter addressed to the Dewan of Cochin, the Dewan says that as regards helping the planters in Cochin at this crisis, no general answer can be given, but individual applications will be treated strictly on its merits; and that as regards the prices of food-stuffs there is no present rise, the markets are carefully watched and should the interference of the Durbar be necessary, it will not be wanting.

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association

Proceedings of a Meeting held at the Meppadi Club, on August 12th, 1914.

PRESENT.—Messrs, Darkin, Macbain, Malcolm, Parker, Powell, Vernede, Whitton and C. E. Abbott, (Honorary Secretary.) *Visitors*: Messrs. Blackham, Cammiade, Dobree, Mackay, O'Brien, Simpson. Mr. Malcolm in the Chair.

1904. *Proceedings of last Meeting.*—Were confirmed.

1905. *Vayitri Sultan's Battery Road.*—Read Honorary Secretary's letter to the Executive Engineer P. W. D. West Coast Division and his reply dated June 18th stating that repairs are in progress. Members present who have recently been over the Section between miles 2 and 3 report that there is no improvement, but work is proceeding near Kalpathy.

1906. *Meppadi Post Office.*—Read Honorary Secretary's letter. It seems that the Assistant Post Master who was appointed fell ill soon after his arrival and left the place. Nobody has been sent to succeed him. The Honorary Secretary has again addressed the Superintendent of Post Offices (see para 1900.)

1907. *Tour of His Excellency the Governor of Madras.*—Read Honorary Secretary's letter to Collector of Malabar. The arrangements for the tour have been altered, but it is hoped His Excellency may be able to visit Wynaad.

1908. *The late Mr. West.*—Mr. Malcolm spoke of the regret felt in the District at the death of Mr. West, one of the oldest members of the Association. A vote of sympathy was passed and the Honorary Secretary was instructed to write to Mrs. West and Mr. Keith West.

1909. *Madras Planters Labour Law. Attesting Contracts in S. Canara :*—Read letter from the Honorary Secretary to the Chief Secretary to the Government of Madras asking to have all Village Headmen in S. Canara appointed to attest contracts, pointing out that these are the only class of officials readily accessible to our Maistries ; and the Chief Secretary's reply stating that the matter was receiving attention. Since the date of the Meeting information has been received that all Village Headmen have been authorised. The Honorary Secretary was instructed to address Mr. Cammiade, Divisional Officer on the subject of having Mysore Patel's attestations recognised by the Madras Government.

1910. *Mr. Justice Sadasiva Iyer's Ruling.*—Read letter to Mr. Nicolls from Honorary Secretary and reply. Noted. This ruling will be circulated.

1911. Honorary Secretary stated that he had applied for copies of the Government Orders on the working of the Act in 1913 and on Malaria in Wynaad.

1912. *U.P.A.S.I. Meeting.*—Mr. Abbott read the Delegate's report :—

I attended the Bangalore Meeting which opened on July 6th as your Delegate. It was I believe the shortest Meeting of the U. P. A. S. I, that has been held, but was nevertheless a very important one,

The fact that there had been a special Meeting in March tended of course to shorten the proceedings. The principal subject discussed was the starting of the Labour Department which came into existence on July 1st. This is the biggest business that has ever been undertaken by the U.P.A.S.I. and the success that has attended the proposal to start it, which was made at 1913 Meeting, shows that its necessity was strongly felt. More than 95,000 acres have joined and agreed to pay Rs.2 per annum for 5 years. So the Department starts with an income of Rs.190,000, or well over £12,000 a year. It is a large sum of money, but it can all be spent and I believe profitably spent on the objects for which it was intended. I believe that Planters in Southern India will now be in a position to successfully combat the competition of recruiters from other parts of the world and that we shall gradually find ourselves relieved of the constant worry that has been pressing on us for so long. The constitution of the Control Committee of the Department has been a subject of a good deal of criticism both from supporters and opponents. I am very glad to say that these objections have been very fully met, and I think we are indebted to Mr. Pinches, Messrs. Finlay & Coy's. representative, for the way he met them. Your wishes as expressed to me at our last Meeting have been carried out in their entirety. To put the matter shortly, all vacancies that occur on the Committee with the exception of course of Messrs. Finlay & Coy's two representatives, will be filled by election by the U. P. A. S. I. Council.

The meeting confirmed the resolution that was passed last year with regard to the service of warrants in Mysore. I brought forward the subject of the South Indian Planters Benevolent Fund and proposed certain alterations in the rules. These were agreed to after some discussion with one or two alterations suggested by other Delegates which were, I think, improvements. There will be a full report in the Book of Proceedings, and new copies of the Rules will be circulated. I may as well state here what the alterations will be. The alterations are in Italics.

Rule VII.—That the Secretary of any District Association may, with the sanction of his Association or Committee, give temporary relief in case of emergency *to the extent of Rs. 200 in any one case provided that the applicant for relief is a Member of his District Association and has been a subscriber to the Fund.*

To add to form A under F Name and Address.—Whether the applicant has been a subscriber to the Fund. The date of the receipt for his last subscription and whether the applicant is a Member of his District Association.

Rule VIII.—Particulars of any case for assistance shall be forwarded to the Secretary of the District Association concerned with form A filled in, which must be vouched for by two friends of the applicant to whom he must be personally known. Such information shall be circulated to the Finance Committee formed for the administration of the Fund hereinafter referred to as the Committee, for their sanction *with an intimation that replies must be received by the Secretary within 10 days of the date of his letter in default of which the Member concerned will be considered to have voted in favour of the application. No payment is to be made from the Fund before the expiry of this period.*

Rule IX (d).—European Members of the Planting Community or their families, other than those classified under A, B, C, above, may receive

assistance from the Fund only by the unanimous consent of not less than a quorum of the Committee of District Association. *The total of grants to non subcribers to the Fund shall not exceed Rs. 500 during any financial year of the U. P. A. S. I. This shall also apply to loans granted to non subscribers under section 10. e.*

Rule X (c).—"*No grants involving periodical payments shall in the first instance or in the case of subsequent renewal be made for a longer period than 6 months.*"

Rule X (f).—Which gives the Committee power to alter any rules is to be deleted. Now that we have some experience it seems unnecessary.

I wish that more Members of this Association could see their way to become subscribers to the Fund. Tea has been doing well of late years, and Proprietors have been able to behave liberally to their employees in the matter of leave allowances and paying passages to Europe. So it may seem to some to be unnecessary to subscribe to a Fund designed to help Planters, who are in temporary difficulties. I think this is a short sighted view.

Scientific Officer.—The discussion on this subject was held in Committee. Mr. Chadwick, the Director of Agriculture, was present and explained what Government is prepared to do. The U. P. A. S. I. has been asked to increase its contribution considerably. It is believed that including the contribution from the Native States it will be possible to raise the money. It is not a time to deliver a long address on the benefits of Science to Agriculture. But we have to earn our living and I hope the Book of Proceedings will contain a full report of what was said which all of you will study. I just want to put on record that the Government of Madras is prepared to act very liberally to us. It will take over the Department allowing us to retain Mr. Anstead's services just as at present, and will also appoint a Mycologist on the same conditions; it will put up buildings at Coimbatore, establish and pay for an experimental station and its necessary staff, probably in the Anamalis, and in fact run the whole business for us. It will bear the whole capital cost of this which will be large, and is also willing to pay over Rs.30,000 a year independent of whatever we contribute. The offer is a very handsome one and ought to be accepted. I have seen the correspondence and would like to say how much we owe to Mr. Chadwick's advocacy. In him Planters have a very good friend. The Honorable Mr. Barber has also done a great deal to bring about the result.

I have been working with Mr. Barber on the Committee of the U.P.A.S.I. and of the Labour Department for the past three years, and I cannot lay aside the task without expressing the fact that the whole community is under a great debt to him for all he has done for it. He is a busy man, but he has cheerfully given up time to this work that he could ill spare.

Mr. Nicolls too, who is one of our own Members as well as Chairman of the Nilgiri Association, has worked untiringly during the past year to make the Labour Department a success that is largely due to his efforts.

A hearty vote of thanks was passed to Mr. Abbott for his services and the report was ordered to be printed with the Proceedings.

1913. . *P. W. D. Bungalows.*—Read letter from the Executive Engineer West Coast Division informing Members that P. W. D. Bungalows must not be used by the public without the permission of the Collector. It is understood that this permission, when granted, is personal and permanent;

it need not be applied for every time a Member wishes to use a bungalow. The bungalows likely to be used by Members are at Lakkidi. Kalpathy, Meenangadi, Pookote, (and Poodupady if the Hotel stabling is not available.)

1914. *Stencilling Weights on tea chests.*—Read letter from London Association of Tea Buyers to Indian Tea Association objecting to the net weight of tea being marked on chests, as this may differ from the customs weight, and cause confusion to foreign buyers. It is not considered necessary to take any steps to alter the practice.

1915. *Revenue Settlement of Wynaad.*—Read correspondence. The Hon'ble Mr. L. Buckley, I. C. S. intends to visit Wynaad early in October, and a Meeting of the Association will be held. He has promised to send a copy of a note he has prepared for discussion to the Honorary Secretary.

1916. *Book on South India.*—The Meeting confirmed the Honorary Secretary's action in paying for a page of this work.

1917. *Meeting at Madras.*—Read correspondence. The Association is not sending a Delegate, but the district will be represented.

1918 *War Relief Fund.*—It was proposed by the Chairman and carried unanimously that a list be circulated among Planters in the District asking for contributions to the Prince of Wales's Fund for sufferers by the War; the total collected will be remitted to London and lists of subscribers will be posted in the Meppadi and Vayitry Clubs.

Papers on the table.—Letter from Messrs Wilson and Co., Madras, who can supply soap for spraying mixtures.

(Signed) B. MALCOLM,
Chairman.

(„) C. E. ABBOTT,
Honorary Secretary.

AMERICA'S TEA CONSUMPTION: 1904-1913.

We are indebted to the *American Grocer* for the following interesting statistical statements regarding tea in the United States:—The net import of tea for the fiscal year ending 30th June, 1913, was 93,911,055 lb. at an average import cost of 18·4 cents per pound, equivalent to 0·95 lb, per per capita. This is a decrease of 6,483,841 lb. in imports from 1912. From 1904 to 1913 the imports for ten years were as follows:—

Year ending 30th June.		Net Imports lb.	Average Import cost per lb. cts,	Consumption per caput lb.
1904	...	109.622.518	16·1	1·31
1905	...	101,937.084	15·8	1·19
1906	...	92,565,853	15·6	1·06
1907	...	84,848.261	16·1	·96
1908	...	93,103,090	17·3	1·03
1909	...	114,157,437	16·2	1·24
1910	...	83,298,009	16·0	·89
1911	...	99,366,576	17·2	1·04
1912	...	100,394,896	18·0	1·05
1913	...	93,911,055	18·4	·95

—*The Ceylon Observer.*

COFFEE.

The Commercial Aspect of Coffee.

(Continued.)

In 1674, was published an interesting leaflet of which an original specimen is preserved at the British Museum. It is entitled: "The Rules and Orders of the Coffee House," and was published by Paul Greenwood, who selleth the best Arabian coffee powder at the sign of the coffee mill and tobacco roll in cloth fair in West Smithfield."

"Enter sirs freely, but first if you please
Peruse our civil orders, which are these—
First, gentry, tradesmen, all are welcome hither
And may without afront sit down together;
Pre-eminence of place none here should mind
But take the next fit seat that he can find,
Nor need any, if finer persons come
Rise up to assign to them his room;

To limit men's expense we think not fair,
But let him forfeit twelve pence that shall swear.
He that shall any quarrel here begin
Shall give each man a dish t'atone the sin,
And so shall he whose compliments extend
So far to drink in Coffee to his friend;
Let noise of loud disputes be quite forborn
No maudlin lovers here in corners mourn,
But all be brisk and talk, but not too much,
On sacred things, let none presume to touch
Nor profane Scripture, or saucily wrong
Affairs of State with an irreverent tongue:
Let mirth be innocent, and each man see
That all jests without reflection be;

To keep the house more quiet, and from blame
We banish hence, cards, dice, and every game;
Nor can allow of wagers that exceed
Five shillings, which oft times much trouble breed;
Let all that's lost or forfeited be spent
In such good liquors as the House doth vent,
And customed endeavour to their powers,
For to observe still seasonable howers.
Lastly let each man what he calls for pay,
And so You're welcome to come every day,"

THE VIRTUE OF THE COFFEE DRINK.

First publiquely made and sold in England by Pasque Rosee, The grain or berry called Coffee, groweth upon little trees only in the deserts of Arabia.

It is brought from thence and drunk generally throughout all the grand signors dominions.

It is a simple innocent thing composed into a drink by being dried in an oven and ground to powder, and boiled up with spring water, and about

half a pint of it to be drunk fasting an hour before, and not eating an hour after, and to be taken as hot as possibly can be endured: the which will never fetch the skin off the mouth or raise any blisters by reason of that heat.

The Turks' drink at meals and other times is usually water, and their dyet consists much of fruit, the crudities whereof are very much corrected by this drink.

The quality of this drink is cold and dry, and though it be a dryer it neither heats nor inflames more than hot posset.

It closes the orifice of the stomach and fortifies the heat within. It is very good to help digestion and therefore of great use to be taken about 3 or 4 o'clock afternoon, as well as in the morning.

Its use quickens the spirits and maketh the heart lightsome. It is good against sore eyes and better if you hold your head over it and take in the steem that way.

It suppresseth fumes exceedingly, and therefore good against the head-ache and will very much stop any defluxion of rheums that distil from the head upon the stomach and so prevent and help consumptions, and the cough of the lungs.

It is excellent to prevent and cure the dropsy, gout and scurvy. It is known by experience to be better than any other drying drink for people in years, or children that have any running humours upon them such as King's evil, etc.

It is very good to prevent miscarryings in child-bearing women,

It is a most excellent remedy against the spleen, hypocondriar, winds or the like.

It will prevent drowsiness and make one fit for business, if you have occasion to watch, and therefore you are not drink it after supper unless you intend to be watchful, for it will hinder sleep for three or four hours.

It is observed that in Turkey where this is generally drunk that they are not troubled with the stone, gout, dropsie or scurvey, and that their skins are exceedingly clear and white.

It is neither laxative nor restringent.

Made and sold in St. Michael's Alley in Cornhill by Pasqua Rosee at the sign of his own head.

From a handbill preserved in the British Musem, printed about 1665:

An exact description of the growth, quality and virtues of the leaf tea by Thomas Garaway In Exchange Alley near the Royal Exchange in London, tobacconist and seller and retailer of tea and coffee.

.....
.....
.....
.....
.....
.....

And to the end that all persons of eminency and quality, gentlemen and and others who have occasion for tea in leaf may be supplied. These are to give notice that the said Thomas Garaway hath tea to sell from sixteen to sixty shillings the pound.

And whereas several persons using coffee, buy the powder thereof by the pound, or in lesser or greater quantities, which if kept two days looseth much of its first goodness.

And for as much as the berries may be kept after drying if need require for some months. Therefore all persons living remote from London, and have occasion for the said powder, are advised to buy the said coffee berries ready dried, which being in a mortar beaten, or in a mill ground to powder, as they use it, will as as often be brisk, fresh and fragrant, and in its full vigour and strength as if new prepared, to the great satisfaction of the drinkers thereof, as hath been experienced by many in this city. Which commodity of the best sort the said Thomas Garaway hath always ready dryed to be sold at reasonable rates.

ADVERTISEMENT.

That Nicholas Brook, living at the Sign of the Frying Pan in St. Tulies Street, against the Church, is the *only known* man for making of mills for grinding of coffee powder, which mills are by him sold from 40 to 45 shillings the mill.

"NEWS FROM THE COFFEE HOUSE."

A POEM.

Printed by E. Crouch for Thomas Vere at the Cock in St. John St., London, 1667. (14 verses).

"You that delight in wit and mirth
And long to hear such news
As comes from all parts of the earth,
Dutch, Danes, and Turks and Jews
I'll send ye to a rendezvous
Where it is smoking new,
Go, hear it, at a coffee house
It cannot but be true.

.....
.....
.....
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.....
.....

"They know all that is good or hurt
To dam ye or to save ye:
There is the College, and the court
The country, camp and navie,
So great a universitie
I think there ne'er was any
In which you may a scholar be
For spending of a penny."

(Conclusion of Part I.)

SOIL IMPROVEMENT.

The Liming of Soils in the Tropics.

One of the principal reasons why it has been found difficult to give advice in regard to the desirability of liming soils in the Tropics is afforded by the scantiness of exact information and the circumstance that lime in the soil hastens the decomposition of organic matter, the supply of which, under most estate conditions, is limited. But apart from these important theoretical considerations there are the results of actual trials with lime on tropical crops, many of which have been discouraging and, in some cases, contradictory. With a view to ascertaining in a general way the extent and efficiency of available information in the liming of soils in the West Indies, various authoritative references on the subject have been examined, and this article is the outcome.

It is not considered necessary to enter into the well-established facts concerning the chemical, biological and physical action of lime on soils in general. This information can be readily obtained from former volumes of the *Agricultural News*. It will be well, however, to state that in this article the term "lime" is used to represent slaked lime (CaOH) ; the unhydrated oxide is referred to as quicklime (CaO) ; and lime-stone as carbonate of lime ($CaCO_3$).

It is proposed to discuss first the results obtained with lime in actual trials with cultivated crops under field conditions.

Experiments With Lime in the West Indies.

Most of the West Indian investigation work on liming the soil has been carried out in British Guiana, the Leeward Islands, and Jamaica. In the first named colony (see *West Indian Bulletin*, Vol. XIII, No. 2) it has been shown that 'there is a great loss of "available" lime from the soil of limed sugar-cane plots, due mainly either to loss by surface washings, or to the lime being carried into the deeper layers of the soil, or to a large proportion of the lime being retained in the soil in the form of silicate.....

'The use of lime resulted in largely increased yields during the earlier years of the trials. But whether or not its use results in profitable increases depends on the price of sugar. Its action is principally mechanical in improving the texture of the land, and it is a question of much importance whether this effect could not be obtained more profitably and at a lower cost by the use of light ploughs or cultivators.'

As regards the effects of lime on sugar-cane soils in the Leeward Islands, we have the evidence afforded by the results of several series of trials carried out during 1902-5 and described in the Reports on Sugar-cane Experiments in the Leeward Islands for the years mentioned. In these reports such observations as the following appear: 'The plots receiving lime (in St. Kitts) gave smaller returns than the plots not receiving lime. Small quantities of lime thus applied do not appear to have any manurial value.' Again in the case of Antigua where the soil is such that considerable benefit might be anticipated : 'There was an increase of 293 lb. of sucrose on the plots receiving 150 lb. of lime, but no increase on the plots receiving 300 lb. of lime. The use of lime in these small amounts appears to be without influence.' It should be observed that *small* dressings were applied : larger applications would doubtless have a considerable beneficial action on the mechanical conditions of heavy soils.

In the case of Jamaica, the Department of Agriculture obtained a few years ago more promising results than were got in the Leeward Islands. It is stated in the *Journal of the Jamaica Agricultural Society* (May 1914

that the application of lime to sugar-cane soils was found to be actually remunerative, but one has to be careful in accepting this statement as being one of general application, even for Jamaica.

From time to time small trials have been made with lime as a fertilizer for ground nuts and other provision crops in the West Indian Islands, but in nearly every case the results have been inconclusive.

Sources of Lime.

It is possible that certain well defined cases exist where the application of lime owing to the physical condition of the soil is very desirable, but neglected because of the difficulties in procuring the lime. In the West Indies limestone is fairly generally abundant and in many places kiln-burning is a local industry. In districts where lime cannot be readily obtained, limestone might possibly be ground on the estate by means of a machine such as that described in the *Agricultural News*, Vol. XII. p. 223. A still better procedure would be to manufacture quick-lime in a rotary kiln.

It is a fact of some importance that lime is not so inexpensive as many may imagine. In Jamaica for instance, a barrel of dry (temper) lime weighing 220 lb. costs in Kingston 4*s*. though it can be bought on the spot in the country for 1*s*. to 1*s*. 6*d*. This has been mentioned to show that the cost of the material and its application may form a deterrent to its employment even if doing so seemed theoretically desirable. It should be added that lime is employed more often than ground limestone because lime has a more pronounced flocculating effect on clay soils, and, therefore, 'lightens' them more readily.

Special Effects of Lime.

Recent research has considerably extended our knowledge of lime as a factor influencing biological changes in the soil. Work at Rothamsted has shown that the addition of small quantities of quicklime to soils stimulates general bacterial growth, but large quantities cause a depression and a destruction of certain large protozoa and finally a cessation of all biological processes. When lime is converted into carbonate or combines with soil constituents, there is a great increase in the number of bacteria and an acceleration of ammonification. But it is probable that the benefit of lime is more physical than chemical, through the flocculating and consequent improvement of soil permeability to the circulation of air and water. In considering the biological effects of quicklime, the value of this substance as a sterilizer in the case of certain root diseases of plants may be noted, *e.g.* root disease of cacao caused by *Rosellinia* sp. Lastly there is the interesting observation made in Jamaica that the presence of lime prolongs the vegetative period of the sisal hemp plant, *i.e.*, retards the time of poling. This is of significance in considering the application of lime to soils with a view to its influence on the habits of cultivated plants.

Of more theoretical then practical interest is the conclusion arrived at Rothamsted, that certain Bacteria can oxidize calcium oxalate to calcium carbonate in the soil if the lack of other food makes it necessary for them to employ it in nutrition. There is also of interest the recent work on the calcium-magnesia ratio in the soil. But these matters do not help us in coming to clear decisions as to when lime should be applied to the soil. It will be evident that the whole subject requires revision experimentally and is one to which the attention of experiments station workers may well be directed. For the present no general principles can be laid down for tropical soils as a whole. Each particular area will demand local investigation until more experiments have been made in different places and the results from them brought into better agreement.—*The Agricultural News.*

CORRESPONDENCE.

THE EDITOR, 27th August, 1914.
Planters' Chronicle,
Bangalore.

Dear Sir,—I enclose herewith a cutting of an article which appeared in the *Daily Mail* of 27th July which I think is really worth re-printing in the *Chronicle.*

The last paragraph is certainly interesting in view of the present political state of affairs.

Yours faithfully,
DUM DUM.

Germany's Debt to Britain.
School of Colonial Policy.
Herr Dernburg in the City.

Herr Dernburg, late German Secretary of State for the Colonies, made generous acknowledgment in a speech in London on Monday of the debt which Germans owe to Britain. He referred particularly to British Colonial policy, the study of which had provided him with the solution of many a difficult problem of Colonial administration.

Herr Dernburg's speech was made at a luncheon given by the London Chamber of Commerce to 120 members of the Berlin Society of Merchants and Manufacturers who are on a visit to this country, principally with the object of getting into closer relations with English business men.

Herr Dernburg, replying to the toast of "Anglo-German Trade," said that before the war of 1870, enterprising Germans, in quest of some larger field of action, could not find it at home, and it was notably England that offered them the commercial and industrial possibilities they were looking for. In his own family no fewer than four big houses in London and Lancashire had sprung up and prospered.

THE BRITISH EXAMPLE.

When Germany had become strong enough to acquire oversea possessions of her own it was again the English who, by their example, statesmanship, and experience, gave Germany the best help Whenever he was in difficulty as to how a certain Colonial problem ought to be handled he had found a solution in the study of British methods, and he was pleased to record here his most sincere thanks for the kindness and friendly interest he had received in these matters both from the central authorities in London and from the statesmen in the British possessions in Africa and elsewhere. His travels had taken him through a number of British possessions. He knew from history how much blood and money it had cost the English nation to gather the experience which had always been most fully placed, gratuitously, at his disposal.

England and Germany were the great competitors in the shipping business of the world; when their interests began to clash international conferences were held in London, arrangements concluded, and satisfacfactory solutions arrived at. And so far as the German side was concerned, he could say on good authority that whenever such differences arose in future they would be settled and arranged in the most friendly spirit, giving due weight to the interests at stake on both sides.

He was glad to say that political relations between their two countries had attained that normal state which permitted both to regard events without mistrust. And it was well to remind themselves what great help England and Germany had rendered to the arbitration movement now settled in the International Bureau at The Hague,

August 28th, 1914,
Ootsey, Mudigere P. O.,
Kadur District.

Kalisyndicate Experiments.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—It may perhaps have seemed strange that I did not reply to Mr. C. S. Crawford's letter published in the *Planters' Chronicle* of April 4th, 1914, but my reason was I thought that the matter could be more effectively dealt with by the Scientific Officer as the head of the Department.

Now however, I notice in your issue of the 8th instant another letter from Mr. Crawford in which he accuses me of making a statement which he says was the outcome of my hurried visit to North Mysore in February last. I therefore feel bound to ask you to allow me space in your columns to give my explanation of an unjust remark.

To make my case perfectly clear it is necessary for me to quote other matters which have a very important bearing on the point at issue.

In Mysore there is what is known as a Council of Mysore Associations. It is made up of three representative members of each District Association *i. e.*, North and South Mysore, and the Bababudins. Their duties amongst other things is to keep in touch with the Scientific Department, and in conjunction with the Scientific Officer to discuss and arrange my programme of work, tours, etc., and last but the mort important to keep the members of the Association which they represent fully informed as to my movements, and work.

At a Meeting of the Council held in Bangalore on the 24th August, 1913, a Resolution was passed as follows:—"That Mr. Frattini shall notify the Honorary Secretary of the Council of what experiments he wishes to carry out, and where. The Honorary Secretary shall arrange, through the members of the Council, to get men in each district to take these up." It will therefore be understood that the members of the Council by adopting this Resolution accepted the responsibility of keeping the members of their Association fully aware of any experiments the Scientific Department may wish taken up. A most remarkable fact which is necessary to mention is that at the time of the appearance of Mr Crawford's first letter in the *Chronicle*, he *himself* was one of the representative members of Council for North Mysore. Other Meetings of the Council which were called from time to time to discuss and arrange my programme were not attended by Mr. Crawford. He no doubt however received copies of the Minutes and from these alone (if he cared to look at them) he could very easily have ascertained what he wanted to know.

Further, had Mr. Crawford not received the copies of the Minutes the other two representatives for North Mysore, and who were also members of the Executive of the North Mysore Association, were asked by me at the Council Meeting mentioned above, to make inquiries of their members as to who would be willing to undertake a Kalisyndicate Experiment, and to let me know. This they promised to do.

The following is an extract of a letter dated the 25th October, 1913, from the President of the Council and also Representative of North Mysore. "No one this side is prepared to take on Kalisyndicate Plot.' From this I understood that the members for North Mysore had all been made aware of the Scientific Department's desire for plots for manurial experiments, but that no one was willing to take one up. Whether this was so or not I cannot say, if so, then Mr. Crawford's ignorance regarding them is inexcusable.

Mr. Crawford says that the initiative should come from the Scientific Officer. Is it not clear enough to Mr. Crawford from the explanation I have given above, that the initiative *did* come from the Scientific Officer?

The paragraph in my Circular No. 7 to which Mr. Crawford takes exception is as follows:—"It is a curious fact that two of the busiest men in North Mysoré are the only persons who have consented to undertake one of these experiments." Mr. Crawford has apparently taken it to mean that I do not consider him a busy man. When I wrote the paragraph above I did so in good faith and without any biassed intentions whatsoever. In concluding his letter Mr. Crawford says: "It will be time enough to denounce people when co-operation is refused". As to how far the paragraph in question may be considered a denunciation of those who have not taken up Kalisyndicate Experiments, I will leave to the decision of the Planting Community of Mysore.

With reference to Mr. Crawford's second letter in your issue of the 8th instant, he says:—"Is it too much to ask Mr. Anstead to differentiate between the experiments as a whole and the part I alluded to, undertaken by Mr. Frattini during a hurried visit of which I and others knew nothing. After this visit Mr. Frattini made a statement that there were only two in North Mysore willing co-operate—or words to that effect. Well, in saying this he said what is not true."

It is necessary for me to mention first that the two persons in North Mysore who had consented to take up manurial experiments had informed me of their wish to do so some months before I undertook my journey to North Mysore in February.

At a Council Meeting held in Mudigere on the 4th January, 1914, it was arranged that I should go to North Mysore and interview these gentlemen regarding the experiments they were going to undertake, at the same time the two members for North Mysore were asked if anyone else wished to see me, and the answer was No. This clearly explains the reason why no one else saw me, and I hope Mr. Crawford will now understand that it was the negative reply given by the two members for North Mysore which caused my visit to be a hurried one. I also wish to emphasise the fact that the statement in my Circular No. 7 was made quite independent of this visit, and in no sense did I mean one to be outcome of the other.

In the last paragraph of his letter Mr. Crawford rather twists the sense of my statement making it more severe. The words he uses are not to the same effect at all. I *did not* say "that there were *only* two men *willing* to *co-operate*.

Mr. Crawford all through has made statements without foundation and it would have been far better had he first made sure he was laying the blame on the right party before going into print.

For the lack of information regarding the Kalisyndicate experiments Mr. Crawford must blame the Executive of his own Association who were in Office at the time. As Mr Anstead pointed out in his reply to Mr. Crawford, these experiments have been mentioned in the *Planters' Chronicle* off and on, also in my circulars, and last but not least they have been discussed in one way or another at nearly every Council Meeting, and I doubt if there is another member of either of the Mysore Associations who is able to profess such a state of ignorance regarding them as Mr. Crawford.

I apologise, Mr. Editor, for drawing so largely on your columns. It was necessary for me to go into details at length so as to put the facts clearly.

Yours faithfully,

G. N. FRATTINI,

Scientific Assistant for Mysore.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish the Proceedings of the Nilgiri Planters' Association. Mr. Nicolls', opening remarks are very much to the point, but we are glad to be able to say that since they were made, we have learnt that the Clan Line Steamers have reduced the surcharge to 25% and that the freight on London Cargo need not be prepaid.

We still hope that those who have subscribed to War Funds, through District Associations, will advise their Secretaries to transfer their subscriptions to the Imperial Indian Relief Fund, and that all such should go through the U.P.A., so that our Association should appear in a manner not disproportionate to our importance and standing in the country. At the foot of this page we publish and shall continue to publish the receipts of such subscriptions that will go through this office.

Messrs. Nicolls and Brock gave a full report of the Proceedings at the last Annual Meeting as Delegates.

We publish an interesting article on the Metric Sytem taken from "Nature," and we cannot help thinking that after this most stupendous war is ended, and the Map of Europe changed, that among the changes of the future for the sake of facilitating commercial transactions amongst all nations, the metric system will be introduced throughout the world.

We publish a letter from Mr. Birnie, late Agricultural Officer to the Potash Syndicate. We have had many opportunities of meeting him here, and recognise not only his ability, but his keenness in his work, and hope that when this war is over we may welcome him back.

IMPERIAL INDIAN RELIEF FUND.

Received from	Mr. Prince	Rs. 25
,,	,, Mr. Bolton	,, 50
,,	,, Mrs. Bolton ...	,, 50
,,	,, Mr. F. Norton ...	,, 50
		Rs. 175

BAROMETER

OF

Labour Department.

	100,000
8-8-14	96,243·78
25-7-14	95·471
11-7-14	95,434·21
4-7-14	94,450·41
27-6-14	90,219·41
20-6-14	89,619·41
13-6-14	88,574·41
6-6-14	86,429·41
30-5-14	84,867·41
23-5-14	82,851·41
2-5-14	82,293·90
25-4-14	79.820
18-4-14	77.958
11-4-14	74,607
4-4-14	73.057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

At a meeting of the Association held on Wednesday 26th, 1914.

PRESENT.—Mr. J. S. Nicolls, in the chair: Mr. G. W. Church, Honorary Secretary; Mr. T. Stanes, Mr. W. Rhodes James, Mr. C. H. Brock, Mr. W. A. Cherry, Mr. E. S. Clarke, Mr. C. Gray, Mr. A. Dandison, Mr. F. G. Lechler, Mr. R. N. C. Groves, Mr. A. R. Pigott, Mr. S. Bayley, Mr. B. A. Marden, Mr. Collin Hindley, Mr. Rodgers, Mr. K. Downing, Mr. J. H. Wapshare, Mr. T. Beaver, Mr. T. Brown, and Mr. W. Rowson. *Visitor*: Mr. M. Young, I.C.S.

PROCEEDINGS OF THE LAST MEETING.

The proceedings of the last meeting were taken as read.

Before the regular business of the meeting commenced, Mr. J. S. Nicolls made a few preliminary remarks and said "Gentlemen, before asking our Honorary Secretary to read out the notice calling the meeting and dealing with the items on the agenda, I trust you will bear with me for a few minutes. There are at the present moment certain questions which are not on the agenda and which are casting a cloud over our industries and I have thought it advisable that they should be brought up for discussion, although such action may not be strictly in accordance with the rules of our association. Being of an urgent nature I see no reason against their being discussed. I would first refer to the increased freight, which has been put up to 30 per cent. by some shipowners, and also a provision that the freight should be paid at the port of shipping. Not a few of us find financing at this moment no easy task. The only Bank in the Presidency that is in a position to help us has come to our rescue and will no doubt help us over the present crisis. If the present war should last longer than we expect we must endeavour to arm ourselves against all possibilities. Patriotism is not lacking amongst planters, and I speak for all my brother planters with the full confidence that we are prepared to do what our Mothercountry expects of us. Ship owners, however, seem to have no idea of patriotism. You have all perhaps read that the Imperial Government has decided giving a rebate of 80 per cent. on Hull war risk insurance and there is no likelihood that owners will not avail themselves of this offer. The Imperial Government could have had only one object in view, and that to facilitate trade with the Home country. We, as shippers, insure our cargo at war risks and it matters nothing to the carriers, so I fail to see why shipowners should charge anything more than in times of peace. They are certainly making trade with the old country difficult. We expect no rise in prices but wish to get our produce shipped home to supply the needs of those in England and at the same time adding to the coffers of the home country by the payment of import duties.

I think this is a matter we might pass on to the U.P.A.S.I., asking them to represent matters to the Imperial Government through the correct channels. I am not certain whether the rebate of 80 per cent. on Hull Insurance is only relative to the Atlantic trade, but this is a point our Honorary Secretary might be instructed to find out for us. I think shipowners ought to look upon the situation in a more patriotic light. We all expect to lose something over the war and the shipowners' one aim or object ought to be to get produce home as quick as possible and not to make shipping prohibitive. Our Honorary Secretary has with my permission opened a war fund. I have given him a donation of Rs.25 and will be prepared to give an extra donation of

Rs.25 for every ten members giving a similar amount each and wish I could afford more. You will have read in the last *Planters' Chronicle* a letter suggesting gifts of tea to the Russian army. The idea is a good one, if "Home army" was substituted for "Russian army" and the suggestions of "advertisement buried." It would have to be referred to the proprietors of estates or the agents of Companies.

GOVERNMENT CINCHONA EXTENSIONS.

121. *Devamalla and connected Forests.*—In this connection two letters were read from Mr. Thomas Stanes dealing with the question of acquisitions above the Ouchterloney Valley by Government for the extension of the Cinchona Plantations. Mr. Stanes pointed out that the felling of these forests would seriously affect the water supply of the Ouchterloney Valley, Balmadies and other estates. Fifteen years ago this question was taken up and Mr. Douglas, the then District Forest Officer, made a thorough investigation of the matter, with the result that it was decided that the forest should not be felled. Mr. Stanes also pointed out that already during the present season there had been a scarcity of water on these estates and that if the forests above were now to be felled this scarcity of water would be greatly accentuated. He said that it was originally intended to acquire land on the East but this acquisition was given up because it was represented that the water supply to the Rose and Crown Brewery and the Cordite Factory would be affected. It was pointed out that no reply had been received to letters addressed to the District Forest Officer and Collector so far back as in the months of May and June. Mr. Stanes proposed that the Planting Member or a deputation from the Association should wait on Government to protest against the felling of these forests. The Collector, who was present, informed the meeting that the matter had been before Government for the past 6 or 8 months, and that the matter was being taken up rather late by the Association.

The following resolution, proposed by Mr. R. Stanes and seconded by J. H. Wapshare, was carried unanimously, namely, "That this Association address Government respectfully protesting against the handing over of the Devamalla and connected forest to the Government Cinchona Department which would seriously affect the water supply of the Ouchterloney Valley and adjoining estates."

INCREASE IN THE PRICES OF GRAIN.

122. *Increase in price of Grain.*—Read letter from Mr. Downing:—

Mr. Downing said, since writing his letter, through the efforts of the authorities, the prices of grain had reached a normal value. It was resolved to thank the Collector for the quick action he had taken in the matter.

123. *Leased acreages.*—Read letter from Mr. T. Brown asking for information as regards payment of assessment on "Leased acreages" to the N. P. A. Mr. Brock pointed out that 'Rule 3' covered it. Mr. Brown wished to have the sense of the meeting on the point. It was resolved that a leased acreage was part of an estate and must pay assessment.

124.—DELEGATE'S REPORT.

This was read by Mr. Brock:—

On the twenty first Annual General Meeting of the United Planters' Association of Southern India,

"Gentlemen,—According to your instructions we attended the Annual General Meeting of the U. P. A. S. I. held at the Mayo Hall, Bangalore, on the 6th, 7th and 8th July 1914.

The Meeting was held a month in advance of the usual date owing to the necessity of making the necessary arrangements for the working of our new Labour Department which was started on the 1st July. The Meeting was well attended, 13 District Associations being represented by 23 Delegates and Members and a large number of visitors were present at every sitting.

Full reports of the proceedings in Open Meeting have appeared in the Press, and there is little left for us to report to you, beyond laying stress on the few points in which you are more particularly interested.

LABOUR DEPARTMENT.

We cannot see how anyone who has carefully read the Press reports of the discussions that took place on this subject, can still hold the view, so often expressed, that the Department, or at least the control of the Department is in the hands of any one firm or individual. The Executive Committee is to be constituted as previously laid down at the Extraordinary General Meeting of the U P. A. S. I. in March last, except that the election of the sixth member of the Committee rests solely with the Chairman of the U. P. A. S. I. and the Hon'ble Mr. E. F. Barber. During the initial five years of the Department, which is the term that the present arrangements are in force, any vacancy in the Executive Committee, (with the exception of Messrs. J. Finlay and Co's. two nominated Members,) will be filled by election by the Council of the U. P. A. S. I. Any resolution or regulation as regards the Labour Department must be confirmed or revised at the next Annual General Meeting of the U. P. A. S. I. The Funds of the Department will be operated on by the Chairman and Secretary of the U.P.A.S.I. In brief, while the routine work of the Department is in the hands of the Executive Committee, the full control of it lies in the hands of the United Planters' Association of Southern India.

There is one point that we put forward as affecting planters in this District, who wish to join the Department, but who are not Members of our Association, and who are, therefore, not directly represented on the governing body of the Department. The Executive Committee of the Labour Department have given us their assurance that every subscriber to the Department will receive equal attention and assistance whether he be a Member of any Association or not. Communications on labour matters will be sent to the Manager of the Department direct, who will attend to all points submitted to him by subscribers to the Department, and no reference to or through District Associations will be in any way necessary. If any difficulties arise they will be dealt with by the Executive Committee, and, in turn, their resolutions or regulations have to be confirmed or revised by the next General Meeting of the U. P. A. S. I. We think that this procedure fully safeguards the interests and the requirements of every subscriber to the Labour Department.

The Hon'ble Mr. E. F. Barber has nominated Mr. C. E. Abbott to act for him on the Executive Committee during his absence from India, and has with Mr. J. A. Richardson, Chairman of the U. P. A. S. I. elected Mr. C. H. Brown, (North Mysore) to be sixth Member of the Executive Committee.

In this connection there is only one more point to draw your attention to. During the first year of the Department any one who has not yet joined may do so on the same terms as those who have already done so,but after that period any one who has stood out but wishes to join later will have to pay an entrance fee of Re. 1 per acre in addition to his first year's subscription; but this, naturally, will not apply to newly opened estates that have been newly purchased from non-subscribers.

Railway Freight on Tea Seed.

The Meeting carrried unanimously our resolution on this subject, which was:—"That this Association approach the Railway Companies asking them to take more care over the transport of Tea Seed to insure prompt delivery at the correct destination, and that the various Railways be asked to reconsider their refusal to reduce the freight on Tea Seed as they have already made a considerable reduction on through freights on Tea to Madras."

Proposed Pests Act.

We are glad to report that our representations for legislation to proviue against the spread of pests and diseases in the planting districts has met with better support than in former years, and this is largely due to the way Dr. Leslie Coleman (Director of Agriculture, Mysore) supported our views. The U. P. A. S. I. is now to urge the Governments of Madras, Coorg, Mysore, Travancore and Cochin to legislate for the prevention of the spread of specified pests in local areas of Planting Districts.

Scientific Department.

Though at the last General Meeting of the U. P. A. S. I. the only resolution passed regarding the handing over of our Scientific Department to the Government of Madras was to ascertain if District Associations were agreeable to the proposal, we were informed that the proposal had advanced so far as to result in a definite offer from the Government of Madras to the U P. A. S. I. as embodied in G. O. No. 901 dated 1st July, 1914. Briefly this offer was that the Government of Madras would provide Land, Buildings and Staff for an experimental Station involving a yearly expenditure of Rs. 36,000 rising to Rs. 50,000 per annum, provided the U. P. A. S. I. would provide Rs. 15,000 for five years! From present resources the U. P. A. S. I. can only collect Rs. 9,000 including the various Native State Governments to increase their present grants as the Government of Madras has so liberally increased its financial assistance, and also to invite firms interested in the Planting Industry to contribute towards the new scheme. Individual planters and firms at the Meeting promised support to the extent of Rs. 1,800 per annum for five years. We feel sure that all Planters who are interested in the Scientific side of our profession will welcome the very generous and solid assistance that the Government of Madras have offered us, and it is especially gratifying to find that Government is taking more active interest in our work and welfare than has been the case in former years. Naturally there are objections to face in no longer having the Scientific Department under our sole control, but it is financially impossible to expand the Department, or to derive full benefit from it without the assistance that Government has offered us. If this scheme goes through it will ensure permanency and continuity of Scientific Research, and this alone more than compensates us for all other disadvantages. The Anamallai Planters' Association has offered to hand over 30 acres of their Township Block, felled and cleared, to the Department, and this is equivalent to a saving of Rs. 1,000 in the initial expenses for starting the Experimental

Station. The U. P. A. S. I. now only requiries further support to the extent of about Rs. 4,000 per annum, guaranteed for five years, and we sincerely hope that this help will be forthcoming from the Governments of Native States, and from the many influential firms who handle our produce, so that the new Scientific Department and Experimental Station may be started without delay.

The election of Mr. J. A. Richardson as Chairman of the U. P. A. S. I., will, we are sure, be of special benefit to the Labour Department; the experience he has gained in having, himself, organized a Labour Agency will be invaluable to the Executive Committee.

A unanimous vote of thanks was passed to the Delegates.

125.—*War Fund.*—Mr. T. Brown said he was prepared to follow the Chairman. The following amount was promised in the room. Messrs. Barber and Pascoe (1st donation) Rs. 75, Mr. B. A. Marden Rs. 25. Mr. Thomas Brown Rs. 25 and Mr. J. Gayer Rs. 5.

Mr. Sydenham Clarke said he thought if it was to be a contribution from the Association it had much better be in kind.

The following amounts of tea were promised in the room:—

Mr. J. H. Wapshare	...	2,500 lbs.
,, W. A. Cherry	...	700 ,,
,, Sydenham Clarke	...	500 ,,
,, R. N. C. Groves	...	300 ,,
,, Downing	...	250 ,,
,, Brown	...	100 ,,

The Hon. Secretary was advised to circularize all members on the matter and to find out how produce should be forwarded.

126.—*U. P. A. S. I.*—Circulars read and recorded.

127. *Madras Meeting.*—The Chairman pointed out that he and Mr. Brock had attended this meeting and a circular had been issued to all members. He thought the Association ought to pay Mr. Brock's expenses. It was resolved that the Honorary Secretary should pay Mr. Brock's expenses to and from Madras.

128. *Election of New Members.*—The following new members were proposed and unanimously elected. The Chairman said that they were all more than pleased to once again see amongst their acreages the name of Ouchterloney with that of Wapshare.

J. H. Wapshare, Esq., Ouchterloney Valley.

J. L. Eagan, Esq., Kotagiri.

J. B. Tothill, Esq., Lovedale.

R. Stanes, Esq., Coonoor.

B. A. Marden, Esq., Thia Shola.

J. E. Bisset, Esq., Mayfield Estate,

With a vote of thanks to the Collector for the use of the room and to the Chairman, the meeting terminated.

(Signed) J. S. NICOLLS.
(,,) C. H. BROCK.

THE METRIC SYSTEM.

Since its introduction in the United Kingdom the metric system or question has had its ups and downs. Surely it is very curious that, although in 1862, a Parliamentary Commission recommended its introduction—a recommendation since repeated two or three times—and that a Bill was actually passed by the House of Lords, the metric system has not been adopted in this country. Why do people go on agitating? Well, the reason is the necessity for such a system. The facilities for inter-communication between various countries have a great deal to do with the continual agitation to introduce an international system of weights and measures. You may not know that the first person who put this down in black and white was James Watt. Writing to a friend in 1783, he said it was very awkward that the scientific results of workers in various countries could not be compared readily because of the measurements and weights being so different, and he proposed that they should agitate for the adoption of an international unit of weights and measures for scientific purposes. He wrote to French *savants* on the subject, and the result of the agitation was that in 1790, Prince Talleyrand brought in a Bill before the Legislative Assembly of France proposing that a Commission should be nominated to deliberate on this subject. It was a provision of that measure that the Royal Society of London and the French Academy should nominate the members of the Commission because it was agreed that the Commission ought to be an international affair and not merely a national one. The Royal Society would not agree to it because, as you know, England and France were at a war at that time. Eventually, however, some other countries joined and constituted a Commission.

Another feature of the metric system was also suggested by Watt. He suggested that the unit of length should be cubed, a vessel constructed, filled with water at its greatest density, and that that should be the unit of weight. This cube should be the unit of capacity. In carrying out this idea insuperable difficulties have arisen of an absolutely mechanical nature, and so a kilogram is not any more a decimetre cubed and filled with water, but it is a piece of platinum kept in Paris at a certain temperature and at a certain barometric pressure. But the difference is very slight and does not affect the value of this co-relation between length, capacity, and weight. That is just the same as the standard of British measure—in fact, the real standards of English weights and measures were burned in 1835, in the Houses of Parliament and had to be reproduced afterwards as best they could. Secondary standards have now been made and have been distributed over the country, so there is no danger of standards being lost again.

After giving you this short history of the beginning of the metric system I wish to direct your attention to the greatly different circumstances of communication between the various countries from what formerly existed. The interchange of products between the various countries has increased very much, and it is to the interests of everybody that this interchange should be facilitated as much as possible. One of the greatest facilities is that the same weights and measures should be used everywhere. Now the real requirements of such an international system are two in number. One is that the measures and weights should have the same base ratio throughout; that means to say one pound in the English system should be 16 oz., one ounce should be 16 drams; one foot 16 in.; one yard 16 ft., and so on. That would be a system with the same ratio throughout. Only 16 is not a good one. I am, of course, aware that people say 12 is a good ratio because there are so many aliquot factors in 12—three times four,

twice six—and that consequently 12 is handy. We are, however, faced by the fact that all people on earth who count, count by tens, and that has fixed the base ratio for any international system. If you attempt to put in any other ratio it would lead to confusion, and would not be so convenient, Therefore the base ratio of 10 is essential.

Now as regards a little more of the history of the metric system. In 1861, the old Federation of German States instructed a Commission to propose a national system of weights and measures, and after they had deliberated a short time they came back to the Federation and said, "We must say that the only sensible thing," the only thing that would justify the upsetting of the old measures which were very confusing in Germany at the time—"the only reason for disturbing people and introducing new weights and measures can be to have an international system," At that time the metric system was not as widely introduced as now, and the Commission very carefully went into the question whether they should adopt the English or the French system of weights and measures. It must be remembered that the superiority of England at that time was still very overpowering. It was a little less so than in 1850, still it was preponderant. The United States and Colonies of England all had the English system of weights and measures, so this Commission, consisting of sensible men, might have thought: "We will go with the majority of the manufacturing people and adopt their weights and measures." But when they saw the English weights and measures and went into them they unanimously decided that the metric system there is the same base ratio and divisions everywhere, so you have to learn nothing. I remember in 1895, I had to give evidence before the Parliamentary Committee on Weights and Measures, and I handed in a German school-book on arithmetic. The Committee said, "How many pages are devoted to the metric system?" I showed them that on the back cover there was a note: "Remember a hectolitre is 100 litres; a kilo gram is 1000 grams." The other things are so self-evident that is was considered unnecessary to say anything about them.

The Commission instituted by the old Federation of German States submitted their proposals to the Reichstag in due course; then came the year 1866, which delayed the introduction somewhat, but in 1868, the Act was passed that the metric system should be permissible from January 1, 1870, and compulsory from January 1, 1872. This disposes of the idea that the metric system can only be introduced in times of great commotion and so on. The date of the introduction of the metric system was decided upon long before anybody knew anything about the Franco-Prussian War, and was therefore introduced rather in spite of it than as a consequence of it. About the same time a Committee was appointed by the English Parliament to report on the introduction of the metric system, and after hearing all sorts of witnesses, they reported in 1862, that "in their opinion it would involve almost as much difficulty to create a special decimal system of our own as simply to adopt the decimal metric system in common with other nations." Furthermore, if we did so create a national system we would in all likelihood have to change it again in a few years into an international system owing to the increase of commerce and intercourse between nations."

More than fifty years ago the upshot was that the Committee said it would be a waste of energy to introduce a special English system because owing to the ever-increasing intercourse between nations the nations would be forced into the adoption of an international system whether they liked it or not. That is the real reason why the Decimal Association believes

that the metric system is coming. It may be coming slowly, especially here in England—we cannot help that—but if you consider this point of view, international intercommunication is ever increasing, that the nations are becoming more and more dependent upon the produce of other nations, you will see—you must come to the conclusion that an international system of weights and measures is desirable, and that the refusal of such a system impede progress.

What are the objections? The first that is made is to the decimal point. Owing to the base ratio being 10, and 10 throughout, there is no necessity to use a decimal point. For instance, anybody making drawings puts all the dimensions on the drawings in millimetres. That has two advantages.. You need not put millimetres every time as you put feet and inches (', "), and it avoids a lot of misunderstanding if the drawing has not been very carefully figured, 1' 1" is often taken for 11 in., 2' 4" for 24 in., and all that sort of thing, but if you use millimetres you have not that difficulty.

The decimal point objection is really non-existent because you always take the next lower unit if you find that what you want to express is less than the higher unit, and that is generally quite sufficient. The second objection taken is the size of the unit. That really is an argument that shows into what desperate straits the opponents of the system have reached to find an objection, because I cannot for the life of me see that the metre and the yard are so very much different. Nor are a half-kilogram and a pound so very unlike each other.

The next thing is that the opponents of the compulsory introduction of the metric system say:—"Well, you have got all you want, you have permission to use the metric weights, the Board of Trade will verify them for you; they have the standards so what more do you want?" That is just it. Do not these people see that in compelling manufacturers and traders to have two standards, one for home consumption, and one for dealing with metric countries, they handicap the manufacturers and traders here? And there is another point of view. There was a discussion before the Institute of Inspectors of Weights and Measures on the metric system; they are the people who go about among all the trades-people and have to verify weights and measures, and they ought to know their business. One Inspector said that "from the Inspector's point of view there is one point which advocates should not favour, and that is the agreement that the proposed general Act should be permissive. To have two sets of weights on the shop counter at the same time is not wise. We know what it would be to have a 14-lb. set and a kilogram set alongside the scale; the changes would be rung. The kilogram is very near the size of a 2-lb. weight; the metre near the length of the yard, and the litre near the size of a quart. With these facts before us the Act should, in our opinion, be compulsory.

These are the two arguments:—So long as it is permissive, people who deal with metric countries have to have two standards, and they are handicapped in that way, and poor people are exposed to the danger of being defrauded.

The last objection is on the ground of cost. In order to have a fair idea of what the cost would be it is preferable to examine in detail how various interests would be affected if the metric system were made compulsory after a transition period of, say, two years. Taking first the case of the retail trader with whom the general public have most of their dealings. I think it fair to quote an Inspector of weights and measures who spoke in the discussion just now alluded to. He said:—"The change to the metric weights and

measures would really be very little cost to the shop-keeper, but he does not realise that this is the case. The shop-keeper imagines that the whole of the weighing machines and weights have to be changed, and it is the weighing instruments that are the greatest factor with him. The effect so far as weights and measures are concerned is very small indeed. It does not cost much to change either his weights or his measures, and I refer to measures of length as well as to those of capacity. With regard to the changing of lever machines, we know as Inspectors that it is a very common thing for a weighing machine maker to have to change the whole of his steel-yard markings and to have to rub out the old markings and to mark it anew. In this case it would be a very easy thing to change the markings, which would also apply to platform machines and counterpoise weights. The cost would be very small indeed." We may take it on the authority of the persons whose business it is to know everything about the weights and measures of the retail trade that the cost of the change would not be an insuperable obstacle.

The next interest to consider is the textile trade. Here the opponents of the system contend, the cost of the change would be appalling because all present looms would become obsolete and would have to be replaced by new ones adapted to produce metric widths of fabrics. I had better take that with the engineering trade, because about that the same is said. I say in reply to all these arguments, "What are you doing now? Are you not exporting to metric countries, are not engineers exporting to metric countries? Have not we in our works plenty of metric dimensions to manufacture to; have we ever found any difficulty in doing it? Have we ever had to introduce new machinery especially to make a metric thing? Never!" Even leading screws of English pitch can be used to produce screws of French pitch and *vice versa*. You must put in one wheel with 127 teeth which makes the changes right. You will find you are absolutely correct. When before a Parliamentary Committee I was asked:—"Seeing that in the cotton trade the standard make is what is called 79 in., 37½ yards, 8¼ lb. shirting - which is known all the world over – would it not in some way damage the reputation of the shirting if the figures had to be recalculated in all the markets of the world?" Well, at the time I had not sufficient time in which to make the calculation. What do you get when you recalculate? Seventy-nine inches are 2 metres within one-third of 1 per cent; 37·5 yards are equal to 34 metres to within one-third of 1 per cent.; and 8¼ lb. are 3¾ kilograms. So you see you have been entertaining angels unawares. You have been manufacturing to metric measure. So why say it is difficult? The general experience is that wherever the metric system has been introduced it has at once been accepted as by far the simplest and easiest to comprehend, while it has the great advantage of being international, which is more and more necessary nowadays where the intercourse between countries is increasing.—*Nature.*

LONDON COFFEE RETURNS.

	Home* Consumption.		Export.		Stock.	
	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons
For week ended August 1 ...	208	264	396	598	21,513	16,313
For 31 weeks ended August 1 ...	9,625	9,437	18,320	11,299	—	—

* The Home amount contains a proportion for export delivered by cart.
—(*The Produce Markets' Review*).

TEA.

Brokers' Monthly Reports.

For the Month of July, 1914.

Messrs. McMeekin & Co.

London, 5th August, 1914.

Indian.—The offerings at London Public Auctions were 58,000 packages against 45,000 packages in the same month of 1913. The majority were of New Season's growth from Northern India. The quality generally was unattractive and consequently quotations well below those recently current were registered. In the closing sales some teas of improved quality were shown, which sold readily at higher prices.

The average of Public Sale prices for the month was $8\frac{1}{2}d.$ per lb., against $9\frac{1}{4}d.$ per lb, for the corresponding month of last year.

The Imports were 11,115,000 lbs. and the Deliveries 14,618,000 lbs., leaving in stock at 31st July, 33,861,000 lbs.

This season contrasts sharply with the last in that quantity of early arrivals is comparatively large and quality poor. Some good quality musters from Assam have reached the London market, but nothing has been seen from any district to equal the choice teas sold in August, 1913.

The shipments from Calcutta and Chittagong to London to 31st July were about 6,000,000 lbs. in excess of the corresponding quantity for last year.

Ceylon.—The offerings at London Public Auctions were 127,000 packages, against 159,000 packages in the same month of 1913. The quality, as is usual at this period of the year, was plain and uninteresting, and the general run of the prices realised was under that current in July, 1913. Anything that stood out was well competed for, and in the final auction for the month there was improvement recorded in the value of all but the commonest sorts.

The average of Public Sale prices for the month was $8\frac{3}{8}d.$ per lb. against $8\frac{7}{8}d.$ per lb. for the corresponding month of last year.

The Imports were 11,977,000 lbs. and the Deliveries 11,016,000 lbs., leaving in Stock at 31st July, 24,677,000 lbs.

The Exports from Colombo to London in July were only 11,000,000 lbs. against 14,000,000 lbs. last year. The total shipments for seven months are now just about level with the last year's figures.

Java.—The offerings in London were 21,000 packages and in Holland 26,000 packages, against 20,000 respectively. The London market was fairly well supported throughout, but that in Amsterdam was quiet and generally lower, except for the best grades.

China.—Although a fair quantity of the New Season's growths has now arrived, the demand for such has not been active.

The War.—There is an active private demand arising obviously from the fear that there may be interruption in connection with future arrivals. The difficulty of obtaining insurance upon vessels and cargoes may lead to a suspension of regular sailings, and some authorities consider that it will become necessary for steamers to and from the East to use the Cape route instead of the Suez Canal.

Offerings at London Public Auctions from 1st June till 31st July:—

2 Months.	1914. pkgs.	1913. pkgs.	1912. pkgs.
Indian	92,000	83,000	64,000
Ceylon	283,000	282,000	249,000
Java	39,000	36,000	34,000
Total. .	414,000	401,000	347,000

The following are the figures issued by the Tea Brokers' Association of London as relating to the London Public Bonded Warehouses:—

Imports from 1st June till 31st July:—

	lbs.	lbs.	lbs.
Indian	14,414,000	8,011,000	9,812,000
Ceylon	24,462,000	23,173,000	24,649,000
Java	5,567,000	4,774,000	4,367,000
China	3,699,000	1,512,000	4,512,000
Total...	48,142,000	37,470,000	43,340,000

Deliveries from 1st June till 31st July:—

	lbs.	lbs.	lbs.
Indian	28,943,000	27,302,000	26,190,000
Ceylon	19,882,000	19,329,000	17,867,000
Java	5,735,000	6,059,000	3,794,000
China	3,764,000	3,250,000	3,286,000
Total...	58,324,000	55,940,000	51,137,000

Stock in London on 31st July:—

	lbs.	lbs.	lbs.
Indian	33,861,000	22,446,000	22,807,000
Ceylon	24,677,000	26,080,000	26,610,000
Java	4,829,000	5,452,000	4,508,000
China	7,072,000	9,298,000	12,343,000
Total...	70,439,000	63,276,000	66,268,000

	1914.	1913.	1912.
Stock in all Bonded Warehouses of U. K. at 30th June	78,292,000	77,099,000	73,305,000

—*The Indian Planters' Gazette & Sporting News.*

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1913. lbs.	1914. lbs.	1913 lbs.	1914. lbs.
For week ended August 1 ...	5,210,917	4,919,787	598,078	585,729
For 31 weeks ended August 1..	162,200,579	170,885,807	31,636,752	30,132,247

—*The Produce Markets' Review.*

CORRESPONDENCE.

4 F, South Parade,
Bangalore, 7th September, 1914.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—May I make use of the pages of the *Planters' Chronicle* in order to mention to the Planting Community generally that the "Agricultural Office of the Potash Syndicate" has been closed down during the war? I expect, however, that it will be re-opened on the conclusion of hostilities.

Further, I had arranged with a number of Planters in various districts to visit their estates some time during the next few months and I trust that these will kindly excuse my not doing so in the circumstances.

A number of manurial experiments on various crops have been set agoing in different districts during the past two years, and I wonder if the respective experimenters would be good enough to file away the data of results at the end of the season—or until Peace is restored, when they might then be obtainable on the Office being re-opened.

As I am departing for Home in a few days, I wish to take this opportunity of expressing—on behalf of the Potash Syndicate and myself—my best thanks for their assistance to the many Planters and others who have helped me by carrying out experiments, etc., during my sojourn in India.

I wish also to sincerely thank them collectively for the many occasions of hospitality shown me when in their respective districts.

To Mr. Anstead I am much indebted for many instances of help in various ways and I cannot conclude without specially thanking him for his willing assistance—as well as yourself, Sir, for similar courtesies on many occasions.

Yours faithfully,

ROBT. BIRNIE,
Late Agricultural Officer
to Potash Syndicate.

ESTATE LABOUR.

The total number of labourers employed on the estates amounted to 282,354, compared with 255,912 in 1912. Of these, no less than 201,207 were employed in the Federated Malay States. The statistics of the various races are given in the following comparative table:—

	1912.	1913.
Tamil men... ...	107,875	114,680
Tamil women ...	37,973	58,052
Javanese men ...	17,593	18,250
Javanese women ...	5,987	6,320
Malays	19,426	17,373
Chinese	63,210	75,141
Others	3,848	2,538
Total...	255,912	282,354

—*The India-Rubber Journal.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 38.] SEPTEMBER 19, 1914. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

We publish a report of the Shevaroy Planters' Association. A full account by the Delegate to the Annual Meeting was read, also the Secretary's Report, both being full and clear.

The Labour Department publish, through their Committee, an important notice. It is a clear statement, which should do away with all doubts in the minds of those who do not join at once and in the minds of those who elect to join later.

It is hoped that, unless the ships in which they were to have sailed, have been commandeered, both the Director and the Deputy Director will arrive about the same time in Bangalore. The former comes out in the P & O, "Nyanza," and the latter in the Bibby Liner "Worcestershire."

We continue the article on the Commercial Aspect of Coffee.

From the *Indian Planters' Gazette and Sporting News* we extract the article on Tea, giving statistics of various sorts which must interest tea planters.

The steadiness of the increase in all the figures must be considered most satisfactory.

While the war is in progress we have thought that it would interest our readers to know the composition of the various armies.

We commend Mr. Hindley's letter on the Indian War Fund and Coolies for special notice.

Only just in time to print to-day, the Secretary received the telegram from the Chief Secretary. Only in gravest circumstances, it will be noted, will Volunteers be called on to serve outside their districts.

The Manager, Mercantile Bank of India, writes as follows:—"For favour of publication in your next issue I beg to inform you that the Directors of the Mercantile Bank of India, Ltd., have declared an Interim Dividend on the A & B shares for the half year ending 30th June last at the rate of 8 per cent. per annum free of Income Tax."

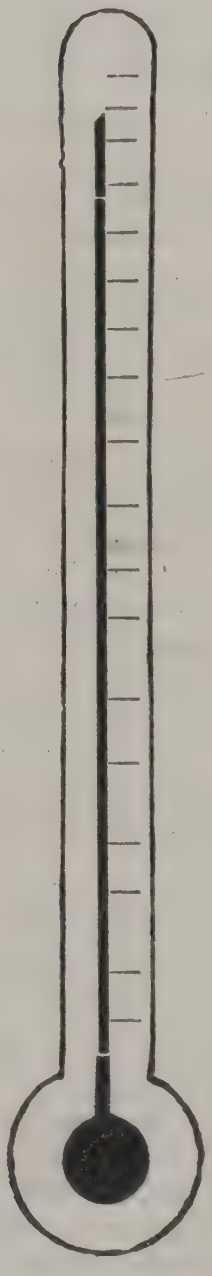
IMPERIAL INDIAN RELIEF FUND.

Previously acknowledged ... ... Rs. 175

BAROMETER

OF

Labour Department.



	100.000
8-8-14	96,243·78
25-7-14	95·471
11-7-14	95,434·21
4-7-14	94,450·41
27-6-14	90,219·41
20-6-14	89,619·41
13-6-14	88,574·41
6-6-14	86,429·41
30-5-14	84,867·41
23-5-14	82,851·41
2-5-14	82,293·90
25-4-14	79.820
18-4-14	77.958
11-4-14	74,607
4-4-14	73.057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

Shevaroy Planters' Association.

Proceedings of the Annual General Meeting of the S. P. A. held at the Victoria Rooms, Yercaud, on 8th September, 1914

PRESENT,—Revd. Father Capelle, Messrs. E. Dickins, R. A. Gilby, C. G. Lechler, J. A. Lechler, A. B. Kundaswamey, K. Leeming, E. L. Poyser, C. Rahm, W. Rahm, B. Short, G. Turner and Chas. Dickins (Hon. Secretary).

(1) The Notice calling the meeting was taken as read.

(2) Read and recorded letters dated 25—8—14 from Mrs B. Cayley and letter dated 1—9—14 from the Right Revd. the Bishop of Pondicherry.

(3) *Delegate's and Hon. Secretary's Report.*—The Delegate's and Honorary Secretary's Reports were read and the Accounts audited by Mr. C. Rahm and Mr. B. Short.

DELEGATE'S REPORT.

Gentlemen,—I attended the 21st Annual Meeting of the U. P. A. S. I. held at Bangalore from 6th to 8th July as your Delegate. The meeting, though the shortest on record, was very successful and represented 13 Districts. It was well attended by visitors and planters. Mr. W. Rahm of this Association attended most of the meetings, and it is hoped that in future more members from here will continue to visit Bangalore during the U. P. A. S. I. week, as by attending those meetings it gives them a better insight of the work carried out by the Parent Association.

After the usual Committee meeting, the meeting was opened by the reading of the Secretary's Report, the Chairman's address, the work of the Planting Member, and the work of the Scientific Officer. These reports appear in the *P. C.* of 11th July, so I will not touch on them.

The Chairman announced that Mr. Somerset Playne was writing a book on S. I. Industries and would like the patronage of the U.P.A.S.I. extended to his enterprise. This was accorded, and Mr. Playne thanked the meeting.

Weights and Measures.—It was proposed, seconded and carried unanimously that last year's resolution on this subject be re-affirmed, *viz*: That the U. P. A. S. I. approach the Government of India again in the hope that the standardisation of weights and measures may speedily become law."

Prevention of Rubber Thefts.—The following resolution was put before the meeting and carried unanimously, *viz.*, that in view of the increasing production of Rubber in Southern India, the Planting Member of Council be asked to ascertain if the Government of Madras will bring in similar legislation to that passed in Travancore and Cochin.

The Adulteration of Coffee.—After a considerable discussion on this subject it was unanimously agreed that the U. P. A. S. I. re-affirm last year's resolution with regard to the adulteration of coffee, and co-operates with the Rangoon Chamber of Commerce in the measures that they are taking to this end. The resolution passed last year was " that Government be approached with a view to dealers in this country being restrained from selling coffee in tins with a large percentage of cheap admixtures, under the name of pure coffee, without adding the percentage of adulterative."

Pest and Diseases and a Pest Act.—This subject was introduced by the Nilgiri Planters' Association. They maintain that, although the Destruc-

tive Insects and Pests Act of 1913 had been passed by the Supreme Legislative Council, it only provided for the prevention of new pests being introduced into the country. A proper sequel to that Act would be an Act for the Prevention of the Spread of Pests and Diseases already in the country. It was pointed out that the time had come to make a start on a small scale, and to try and get a simple law to prevent the spread of pests and diseases in local areas. When this subject was brought up before, one of the chief points raised was that, unless Government took action to keep their Forest Reserves clear of pests and diseases, it was not much use planters attempting to do so. This practically led to the subject being dropped. Dr. Coleman (Director of Agriculture, Mysore) spoke also on the subject, and to the alarming extent that the green bug had spread in the Districts of Mysore, Coorg and Bababudins. He was of opinion that a Pest Act should be introduced into the Mysore State; it was impossible to control the Green Bug unless they had a Pest Act, combined with spraying and the introduction of fungi. He intended to approach his Government in the matter, and hoped the U.P.A.S.I. would strengthen his hands by passing a comprehensive resolution on the subject. To this effect a resolution was put before the meeting and carried unanimously, *viz.* "That the Association ask the Government of Madras to legislate for the local control of pests and diseases in the Planting Districts of Southern India and approach the Governments of Mysore, Coorg, Travancore and Cochin, with a view to asking them to introduce similar legislation."

The Labour Department.—This department was opened on the 1st July, 1914, and was a subject that was discussed to a considerable extent. It was found necessary to appoint a Sub-Committee to enter into fuller details on points that were raised in open meeting and to submit a report to the General Meeting. Messrs. Pinches, Danvers and Waddington were appointed, and their recommendations were adopted by the Meeting *viz.*:—

(1) That the Executive duties of the L. D. shall be conducted by the Committee already appointed.

(2) That in the event of a vacancy occurring in the Committee, such vacancy, with the exception of the two representatives of Messrs. Finlay & Co., be filled by election by the Council of the U. P. A. S. I.

(3) That any resolution, or regulation as regards the L. D. must be confirmed or revised at the next Annual Meeting of the U. P. A. S. I.

(4) That the funds be paid as realised into separate account with the Mercantile Bank of India and shall be available by cheques signed by the Chairman and Secretary of the U. P. A. S. I. The accounts to be audited annually.

(5) That the Executive Committee shall place the matter of subscriptions and guarantees on a business basis as early as possible.

(6) That pending the return of Mr. Aylmer Martin to India the Secretary shall collect as they fall due the instalments directly from subscribers and any expenses incurred on account of clerical work, postages, &c., &c., be met from the Labour Department Funds.

(7) That the Chairman of the U. P. A. S. I. be authorised to advance any necessary funds for the immediate expenses of the L. D.

(8) That Messrs. Finlay & Co. and Mr. J. A. Richardson continue to run their Labour Departments until the return of Mr. Aylmer Martin, the cost from 1st July to date of settlement to be then adjusted.

(9) That new areas opened shall be liable to subscribe from the beginning of the Labour Department year 1st July, to the Calendar year in which they are planted.

The following resolution relating to the Department was also put before the meeting and carried unanimously: "That any Estate joining the Department 12 months after the starting of the Labour Department shall pay an entrance fee of Re. 1 over and above the Rs. 2 per acre per year for the first year of joining; but that any new interest or estate changing hands, not having had the chance of joining previously, shall be allowed to join on the original terms."

The question was also raised as to how the interest of non-members of District Associations, but supporters of the Labour Department, would be looked after. It was pointed out that as far as the Control Committee was concerned it did not matter. The Control Committee would not know whether the complaining party was a member of a District Association or not. All that they required to know was if he was a subscriber to the L. D. The point that really mattered was that every subscriber would receive equal treatment.

The Scientific Department.—At the Extraordinary General Meeting of the U. P. A. S. I. held in March last the case of the Scientific Department was put before Mr. Chadwick (the Director of Agriculture, Madras) and he placed the views of the Association before the Madras Government with the result that Government have made a definite offer to run the whole Department for us at a cost to the U. P. A. S. I. of Rs. 15,000 a year, For this sum we would have as Scientific Officer, Mr. Anstead, a Mycologist, and an experimental station. This is a generous offer, when it has to be considered that beyond the capital expenditure the Madras Government is willing to spend about Rs. 30,000 a year on our behalf. At present the U. P. A. S. I. subscribe Rs. 9,000 a year—leaving Rs. 6,000 more to be raised. The Travancore Government have discontinued their yearly subscription at the end of the first period of the 5 years, *viz.*, Rs. 2,000, but it is hoped that they will reconsider their decision. In the meanwhile the financial position at present is that the U. P. A S. I. require to raise another Rs. 6,000 a year of which Rs. 1,800 was promised at the meeting. The Anamalai Association also have offered to give to Government 30 acres of land, which they will fell and clear for the experimental farm on the Anamalais. It was considered that this position would be suitable, being within easy reach of Coimbatore by car, where there is a large Government laboratory and library which would be at the Scientist's disposal. A resolution was passed thanking the Madras Government for the interest that had shown in the Scientific Department of the U. P. A. S. I.

With reference to the Coffee Experiment Plot. The following remark is taken from the Report of the Superintendent, Government Gardens, Ootacamund:

"Coffee Experiment Plot, Benhope.—There is very little to report under this heading. The plants have made very slow growth in spite of the fact that they have been watered frequently. Insect pests and fungus disease have given a deal of trouble, and the plants have had to be sprayed on several occasions. Coffee robusta is not at all well and the Planting Expert states that the growing of this species may be discontinued as the elevation is apparently too high for it. The Curator visited the plot monthly throughout the year."

Election of Office Bearers.—I voted as follows:—Mr. J. A. Richardson, Chairman; 1st Vice-Chairman, Mr. Graham; 2nd Vice-Chairman Mr. Brock. Mr. C. Abbott represents Mr. Barber who has left the country for a few months.

Finance.—The financial position is in a sound state. For the year ending 30th June, 1914, the Expenditure amounted to Rs.13,505-8-2 and Income to Rs.19,292-6-0, an excess of Income over Expenditure of Rs.5,786-13-10.

The total assets are Rs.22,465-2-4 and Liabilities Rs.6,759-4-5 a surplus of Rs.15,705-13-11, at credit of the capital fund. Transfer from Reserve Fund is shown at Rs.2,550.

This, Gentlemen, closes my report.

(Signed) CHAS. DICKINS.

HONORARY SECRETARY'S REPORT AND STATEMENT OF ACCOUNTS.

In connection with the work of the Association for the past year I have not much to report. We started the year with 36 members and closed with 37, representing 4,915 acres of cultivation. One member resigned after paying his subscription for 6 months, as he thought of selling his Estate.

The income of the Association for year ending end August 1914, including a balance of Rs. 296-5-0 carried over from year ending 1913, amounts Rs. 1,705-12-10 and the expenditure to 1,227-10-3 leaving a balance in hand of Rs. 478-2-7 and is arrived at as follows.

Balance from last year Rs. 296-5-10, outstandings collected Rs. 130. Subscription paid by one member for 1½ months Rs. 3-12-0. By sales of grass and bamboo permits Rs. 32-15-0. From Secretary, U. P. A. S. I. on Account of Delegate's Expenses to Bangalore for the Extraordinary General Meeting Rs. 57-12-0; Subscriptions received from subscribers Rs. 1045 and subscriptions received on account of P. B. F. Rs. 140-0-0.

The Expenditure is as follows:—Office Establishment Rs. 204, two Delegates expenses to Bangalore, one in March and one in July, Rs. 150. Subscription to U. P. A. S. I. on account of 4,915 acres at 2 annas, Rs. 614-6-0. Subscription to P. B. F. from 14 subscribers at Rs. 10 each Rs. 140 (one subscription of Rs. 10 being last year's). Postage in the way of wires, Trea: Tran: P. cards, Coffee price P. Cards, Reg. letters, and letters to Rs.24-11-6, to the Forest Department on account of Bamboo and Grass permits Rs.45-6-0, printing to Rs.46-10-9 and sundries in the way of one Book of Proceedings and stationery to Rs.2-8-0 bringing the total up to Rs.1,227-10-3 and leaving a balance in hand of Rs 478-2-7. The outstandings amount to Rs.50, so when this is paid in the total balance to the credit of the Association should be Rs.528-2-7 together with 133 bamboo and 220 grass permits vulued at Rs.20-2-0. There are only 18 subscribers to the P.B.F. against 14 last year. I thank members for the prompt manner in which they have paid in their subscriptions.

During the year we held 2 general meetings, 6 special general meetings and one meeting at which Mr. Anstead met the members of the Association. All these meetings have been fairly well attended.

The Meetings held during the first part of the year were chiefly in connection with the Labour Department, which was started by the U. P. A. S. I. on 1st July last. The support offered by the Association to the

Department is 2, 982 acres and from non-members 451, making a total of 3,433 acres at Rs. 2 an acre for 5 years.

On the 22nd October last, we had the honour of a visit from His Excellency the Governor of Madras. His Excellency very kindly received a deputation appointed by the Association and discussed with it matters of interest to the Planting Community, *viz.*, roads and the reservation of the land round the Lake. His Excellency was extremely sympathetic and showed great interest in the Hills. He promised to bear our requests in mind and do for us what was possible. I believe steps are being taken for the granting of some of our requests.

Mr. Anstead visited us during the early part of February last and spent a few days on estates situated on the Northern portion of the Hills. He expressed a wish to meet all the members, so a meeting was called at which a friendly discussion took place on planting matters. At the close of the meeting Mr. C. G. Lechler thanked Mr. Anstead for his visit and on behalf of the Association wished Mrs. and Mr. Anstead a pleasant and enjoyable holiday at Home. and that we would again have the pleasure of welcoming him to these Hills.

At Mr. F. D. Short's request the Association moved in the matter of the Nagalur Telegraph Office hours, and in consequence Government now keep the office open from 7 a. m. to 9 a. m. and from 12 noon to 5 p. m. The Association thanked the Postmaster-General for granting the request asked for.

With reference to the subject of Feeder Roads; at the U. P. A. S. I. meeting of 1913 our Delegate brought up the subject of these roads, *viz.*, the metalling of the last 5 miles Yercaud to Craigmore feed road, the Yercaud Manjovadie road, and the Killiyar to Pattupadi road. As far back as December last the Hon. Mr. Pears wrote to us, through the U. P. A. S. I., asking what contributions those interested in the above roads would give Government. The Association gave the required information in February last and since then nothing more has been heard, although 2 reminders have been sent to the U. P. A. S. I. As regards the metalling of the Lake to Craigmore Feeder Road, it has been suggested that the Association again approach Government, asking that the cart track on the road of about 7 feet be metalled, after it has been ascertained what sum can be collected. Some are willing to contribute Rs.2 per cultivated acre. and on this basis a rough calculation was taken, and it was thought that Rs.3,000 might be subscribed.

At the request of the Association a cattle pound has been erected out on the Green Hills adjoining the Balmadies Estate for the benefit of planters on that side of the Hills.

This brings my report to an end, and in conclusion I feel I should mention the loss the Association has sustained by the sudden death of two of its members, *viz.*, Mr. B. Cayley and Revd. Father Rochet. They were both energetic and active workers and did much for us by their help and advice. Mr. Cayley was at one time Honorary Secretary of this Association and Revd Father Cochet our representative on the District Board of Salem.

Your Honorary Secretary and Committee beg to place their resignation in your hands and request you will be good enough to elect new office bearers for the coming year. In electing your Honorary Secretary I trust you will agree with me that it is time you had some other member to carry on the work of the Association. The old saying is "nothing like new blood" and I am sure that saying is not out of place in this instance. I thank one and all for the help so kindly tendered me during the past year.

As is usually done, I trust you will appoint 2 members at this meeting to carefully go over my statement of accounts, and pronounce as to their correctness or otherwise.

I was asked by the Agent of Messrs. McKinnon & Co. whom I met at Bangalore to place before you his illustrated catalogues of Coffee Drying Machines, Hullers, Peelers, and Pulpers. I have great pleasure in doing this as I believe Mysore and Coorg Planters are very satisfied with the machinery supplied by this Firm. Should any gentleman wish to communicate with the Agent for fuller information the address is :—

Petrie Hay & Co., Hunsur, Mysore Province.

(Signed) CHAS. DICKINS,
Hon. Secretary, S. P. A.

Proposed by Mr. G. Turner, seconded by Mr. C. G. Lechler, and carried unanimously :—" That the Hon. Secretary be thanked for representing the Association at the U. P. A. S. I. Meeting and for his reports. Also that the Accounts be adopted and printed."

(4) *The Auditing of the Association Accounts*—Proposed by Mr. G. Turner and seconded by Mr. C. G. Lechler and carried unanimously " That the Annual Accounts before being laid before the Annual General Meeting be audited by an Auditor or Auditors who shall be appointed by the members at one of their General Meetings.

(5) *The India Imperial Relief Fund.*—Read letters dated 25th August, 1914, from Secretary, U. P. A. S. I. and letter dated 19th August, 1914, from Honorary Secretary, *re.* Planters and Relief War Fund. Proposed by Mr. B. Short, seconded by Mr. C. Rahm, and carried unanimously : " That a Subscription List be opened for H. E. Lord Pentland's Madras War Fund and that the Honorary Secretary be authorised to collect subscriptions from the Members." A Subscription List was started at the meeting and the following members subscribed to the Fund :

	Rs.
Mr. B. Short	50
,, C. Rahm	50
,, W. Rahm	50
,, C. Dickins	50
,, E. Dickins	25
,, A. B. Kundaswamey	10
Revd. Father Capelle	10
Mr. R. A. Gilby	10

(6). *District Board Memember*—Revd. Father Capelle was unanimously elected to serve on the District Board, Salem, in place of the late Revd. Father Rochet and the Hon. Secretary was instructed to place his name before the President of the District Board.

(7) *Election of Office-bearers.*—As no member was willing to take up the Hon. Secretaryship of the Association for the coming year the present Hon. Secretary agreed to do so, and the following members were elected to serve on the Committee.

Revd. Father Capelle, Messrs. S. M. Hight, C. Rahm, G. Turner, W. Rahm, C. G. Lechler and E. Poyser.

A vote of thanks having been passed for the past year's service rendered by the Hon. Secretary to the Association, the Meeting terminated.

(Signed) CHAS. DICKINS.
Honorary Secretary, S. P. A.

LABOUR DEPARTMENT.

Labour Department Circular by Control Committee.

From letters that have been received since the Annual Meeting it seems there is still some uncertainty about the terms on which those who join the Department now and later will be asked to subscribe. The Committee think that it will be well to make a clear statement.

(1) Anyone who wishes to join before June 30th, 1915, can do so on paying up the back calls and promising to subscribe till June 30th, 1919. For instance those joining in January 1915, will have to pay Rs.1-8-0 per acre their subscription to March 31st, 8 annas in April, and 8 annas a quarter hereafter.

(2) Those joining after June 30th next will have to pay Rs. 2 per acre for the U. P. A. S. I. Season July 1st, 1915, to June 30th, 1916, plus Re. 1 per acre entrance fee. This Re. 1 will be added to the amount of their first instalment. Thereafter they will have to pay 8 annas a quarter. They will also have to promise to subscribe up to June 30th, 1919. This promise will be a condition made with anyone joining at a later date. It has been supposed by some correspondents that those coming in after the first year would not have to give any promise of continued support, but could come in on trial as it were. This is not so. It should also be borne in mind that the Association has specially reserved the right to increase the entrance fee for late comers.

(3) The Committee wish to point out that it is greatly to the advantage of planters to join as soon as possible. The Department ought to have details of the District from which subscribers draw their coolies, and of their requirements, some time before next recruiting season. Those who delay joining till they are paying off their coolies will be at a disadvantage.

Mr. Day's arrival has been postponed as the steamer he was leaving by on August 6th was taken over by Government. He is now expected to arrive at the end of September and will take charge of the Coimbatore circle. The Assistant for Salem has practically been decided on by Mr. Martin, and will be appointed as soon as he arrives, also at the end of this month.

The Srivilliputtur and Tinnevelly Agencies are at work and can be communicated with by subscribers recruiting in those Districts, Mr. C. E. L. Ward, Srivilliputtur and Mr. C. N. Prince, Nagercoil being in charge respectively. Agents for the other Districts will be appointed as soon as Mr. Martin arrives.

Managers and Superintendents are requested to send details of their Labour to the Agencies already started so as to give ample notice of what is likely to be required of them.

The English and Tamil names of the subscribing Estates and the Post Office should be given.

EXPORT OF RUBBER FROM F. M. S. FOR JULY.

Exported during July	...	2,971·31
Previously (January to June)	...	13,849·89
Total to date this year	...	16,821·20

The exports for July exceed those for June by 665 tons, an increase of almost 30%.—*Grenier's Rubber News.*

COFFEE.

The Commercial Aspect of Coffee.

Naturally, the great coffee markets of the world are to be found in Brazil, the country of its greatest production, and in New York, the commercial capital of the greatest consuming country, while in Europe, Hamburg, Amsterdam, Havre and Marseilles are all important centres. London, of course, assumes far greater importance than is indicated by British consumption of coffee by reason of the great financial interests involved, banking influences, and, in fact, of its being the most convenient clearing house for produce as well as cash. Thus a separate and distinct export trade in coffee is here transacted by many merchants who do not even cater for home requirements.

It is curious to note that Holland and England, the ancient commercial rivals, are the only countries in which the auction sale is the method adopted by the importer of realizing his product to the highest bidder, and even in Holland it is only Government coffee from Java, consisting of about 25 per cent. of the crop, and the importation of one large concern from Brazil, which is regularly disposed of by auction.

By the courtesy of Messrs. Woodhouse, coffee brokers of Mincing Lane, I am able to show a lantern slide of a coffee catalogue issued by their grandfather, 99 years ago, and to compare it with one of the present day. It is pleasantly illustrative of our national conservative tendencies to note that the size is the same, the shape is the same and so is the general management of the lots, and the practice is still continued of marking in the margin the names of buyers and prices obtained. Only, of course, the custom of sale by candle, of which I spoke in my last lecture, has long since fallen into oblivion. In a prices current list issued from 21 St. Dunstan's Hill, March 14, 1799, by James Woodhouse, Jamaica coffee is quoted at 150*s*. to 184*s*. and St. Domingo 100*s*. to 126*s*.

Within a few years prices seem to have dropped considerably, for on Sep. 15, 1815. Messrs. Masius and Allsup, of 6 Great Tower St., report :—

The price of Public Sales varied lately according to the quantities in demand for exportation. We observed middling fine Jamaica sold lately from 110/0 to 119/6—out of proportion for the lower sorts. For fine ordinary St. Domingo has been offered 80/0. Some inquiry has been for Brazil, but holders will not sell at the prices offered. There are very few parcels offered for sale of Porto Rico and Havana coffee. The quantity of Dutch coffee is inconsiderable and not much of Martinique and Guadelupe.

This article in general appears to be by no means neglected. At the same time we observe no decided opinion of its being lower or higher, and we think it will soon be decided by the real and extensive consumption abroad, which is generally considered increased *double*, even treble the quantity of last year.

A glance at the sales advertised for a few days only of September of that year demonstrate the importance of the Ceylon plantation industry :—

1815.

Sept. 19—By G. W. Rolfe & Co.,
100 hhds. and 200 bags Plantation Coffee.
Sept. 20—By James Vanhouse,
100 casks and 150 bags Plantation Coffee.,
By Kymer McTaggart & Co.,
150 casks and 500 bags Plantation Coffee.
Sept. 27—By J & M. Woodhouse,
200 casks and 500 bags Plantation Coffee.

It should be explained that the importer employs the selling broker, who charges a commission of 1½ per cent., and that the wholesale dealer usually employs his own broker as buyer, also at a brokerage of 1½ per cent. The terms of payment are one month less a discount of 1 per cent. and interest at the rate of 5 per cent. per annum is allowed on the number of days' credit unexpired if prepayment be made. The sole title to the coffee purchased is the possession of warrants for the same made out in lots of 20 bags each, with marks, numbers and weights of each individual package, and, of course, none can be cleared out of bond without the production of same and the payment of 14*s.* per cwt. duty if required for home consumption. All the auction sales are held in the London Commercial Sale Rooms, Mincing Lane. These were rebuilt nearly 30 years ago on the site of older premises in the same occupation. Previous to their institution the auction sales were held in each individual broker's office or at "Lloyds".

At New York, New Orleans and the great Continental centers of distribution the dealers either import direct or purchase their supplies at agreed prices from the brokers employed by the importers. From Santos alone there are, among many shippers, at least three who each annually export the enormous quantity of over one million bags. I refer to Naumann, Gepp & Co., Ltd., of London; Prado, Chaves & Co., of Santos, and Theo. Wille & Co, of Hamburg.

Both Santos, the great shipping port for coffee, and New York, the great receiving center for coffee, are peculiarly well adapted for rapidly handling the commodity. London and the great Continental ports also specialize in discharging and warehousing it. In New York large steamers can come right alongside the warehouses and railway sidings, while barges of a capacity of 5,500 bags take their cargo for uptown and river destinations straight from ship. Electric endless bands have been tried for this business, but not with sufficient success to warrant their general use at present. The donkey engines very rapidly sling 10 bags each time out of the ship's hold. In London, of course, barges have to load up further down the river and bring supplies to such bonded warehouses as Red Lion and Three Cranes, which besides large storage capacity, have an excellent installation of machinery for cleaning and grading to the various sizes of which the berries are capable, the peaberry and boldest sizes, of course, commanding the highest price.

Exports of coffee from Brazil reached their highest in 1909, when nearly 17 million bags were shipped, or to be exact, 2,232,933,227 lbs. Of this immense quantity the United States took 933 million pounds; Germany, 435 million pounds; France, 221 million pounds, and England, 31 million pounds.

The United Kingdom customs duty, as I have previously stated, is 14*s.* per cwt., 1½*d.* per lb., but the consumption per head being only '61 lbs. the revenue produced was in 1912 the comparatively small sum of £174,000. In 1913 there was a slight advance to '63 lbs. per head.

In Holland, Belgium and the United States coffee is free of duty, and the consumption 12'32 lbs., 7'57 lbs., and 9'23 lbs., respectively, for the same year.

Germany increased the duty in August, 1909, from 40 to 60 marks per 100 kilos, say, 3'21 per pound. Notwithstanding this, she used 5'66 lbs. per head in 1912, and a revenue of £4,957,000 was thus obtained.

In France, where the minimum duty is 13 francs per 100 kilos, the consumption was 6'17 lbs. per head and the amount paid the National Exchequer no less than £5,972,000.—*Simmons' Spice Mill.*

(To be continued.)

TEA

Public sales of Indian tea were resumed in Mincing Lane on Monday, the 10th August, when some 26,700 packages were brought to the hammer, and on Wednesday, the 12th instant, the balance, some 13,458 packages. The activity prevailing during the holidays, when a sudden demand for immediate requirements absorbed practically all the tea available up to 9d. per lb., gave place to a decidedly easier tone at the auctions. The proclamation prohibiting the export of tea, and the certainty, that the withdrawal of the important Russian support in the Calcutta and Colombo markets will involve heavier shipments from both these ports to London induced a cautious mood amongst buyers, who although eager to secure sufficient tea up to 9d. per lb. for hand-to-mouth requirements, were able by dividing out parcels to secure fairly adequate supplies of common and medium descriptions at about the rates current at the previous sale, with an occasional advance of ¼*d.* for tea up to 8½*d.* per lb. Competition for the better kinds, however, was very irregular, and prices generally lower, necessitating a good many withdrawals for higher bids.

CUSTOMS' FIGURES FOR TEA OF ALL DESCRIPTIONS.

FROM 1ST to 12TH AUGUST.

	1914.	1913.
Working days ...	(9)	(9)
	lbs.	lbs.
Duty payments ...	12,458,252	7,617,573
Exports	1,339,330	1,740,816
Total ...	13,797,582	9,358,389

	1912.	1911.
	lbs.	lbs.
Working days ...	(9)	(9)
Duty payments ...	7,029,067	8,378,240
Exports ...	1,440,939	1,679,506
Total ...	8,470,006	10,057,746

FROM 1ST JUNE TO 12TH AUGUST.

	1914.	1913.
	lbs.	lbs.
Duty payments ...	61,216,947	51,459,675
Exports ...	9,098,372	10,567,322
Total ...	70,315,319	62,026,997

	1912.	1911.
	lbs.	lbs.
Duty payments ...	48,759,220	45,068,779
Exports ...	10,673,186	8,674,151
Total ...	59,432,406	53,742,930

The latter set of figures show plainly that the deliveries have been systematically and regularly advancing—a very satisfactory feature.

Board of Trade Returns.

July Imports.

	1914. lbs.	1913. lbs.	1912. lbs.
From India ...	13,317,344	8,527,905	10,582,248
„ Ceylon ...	13,282,788	13,708,385	16,115,816
„ China ...	4,043,175	1,530,163	5,419,622
„ Java, &c. ..	3,975,968	3,034,225	3,339,437
Total...	34,619,275	26,800,678	35,457,123

Home Consumption.

	1914. lbs.	1913. lbs.	1912. lbs.
Of Indian ...	14,279,965	12,706,978	12,741,427
„ Ceylon ...	9,514,064	9,004,070	8,522,604
„ China ...	1,196,877	839,630	957,675
„ Java, etc. ...	3,296,021	3,571,500	2,941,749
Total...	28,286,927	26,122,178	25,163,455

Re-Exports.

	1914. lbs.	1913. lbs.	1912. lbs.
Of Indian ...	1,191,751	1,498,532	1,088,449
„ Ceylon ...	1,752,338	2,143,155	1,682,543
„ China ...	784,045	724,171	747,973
„ Java, &c. ...	182,897	304,624	110,942
Total ...	3,911,031	4,670,482	3,629,907

Total Deliveries.

	1914. lbs.	1913. lbs.	1912. lbs.
Total Delivery of all Tea ...	32,197,958	30,792,660	28,793,362

January to July.

Imports.

	1914. lbs.	1913. lbs.	1912. lbs.
From India ...	55,023,233	49,515,014	49,601,109
„ Ceylon ...	69,663,979	68,871,490	70,081,484
„ China ...	6,903,302	3,464,894	9,466,597
„ Java, etc. ...	26,033,785	22,233,856	20,051,730
Total ...	157,624,299	144,085,254	149,200,920

HOME CONSUMPTION.

	1914. lbs.	1913. lbs.	1912. lbs.
Of Indian ...	103,490,097	100,694,276	96,222,821
„ Ceylon ...	52,545,354	50,011,558	51,294,105
„ China ...	8,330,288	4,965,187	6,828,061
„ Java, etc. ...	19,369,160	20,139,042	14,833,286
Total ...	183,734,899	175,810,063	169,178,273

RE-EXPORTS.

	1914. lbs.	1913. lbs.	1912. lbs.
Of Indian ...	10,808,265	11,274,382	8,726,413
„ Ceylon ...	12,410,480	12,158,461	10,644,068
„ China ...	5,934,194	6,441,491	5,483,533
„ Java, etc. ...	1,319,857	1,894,398	907,093
Total...	30,472,796	31,768,732	25,761,107

TOTAL DELIVERIES.

	1914. lbs.	1913. lbs.	1912. lbs.
Total Delivery of all tea ...	214,207,695	207,578,795	194,939,380

STOCK IN BOND ON 31ST JULY.

	1914. lbs.	1913. lbs.	1912. lbs.
Of Indian ...	41,247,000	29,921,000	30,535,000
„ Ceylon ...	18,956,000	23,395,000	26,200,000
„ China ...	7,457,000	9,664,000	14,500,000
„ Java, etc. ...	12,427,000	9,675,000	8,062,000
Total of all tea ...	80,087,000	72,655,000	79,297,000

—*Indian Planters' Gazette and Sporting News.*

TEA.

In reviewing the tea trade for 1913 it is necessary to go back to previous years. In 1910 the trade was fairly satisfactory with an export of about 15,000 boxes; in 1911 native tea merchants, thinking that a revival in the trade might be expected, made up considerably more than in 1910, and the export went up to 26,000 boxes. This proved the undoing of the trade, and with a comparatively big stock held over in London until the next year, 1912 was the smallest on record, only some 6,000 boxes leaving the port. These were absorbed very gradually, and it was not until the early part of 1913 that it seemed there might be a shortage; the small export in 1912, however, had left big stocks in Chinese merchants' hands, and in 1913 they only made up sufficient new tea to mix in with the old. This season, therefore, has seen a slight reaction, and the export amounts to 9,378 boxes, and there is no doubt that if more had been available it would have been shipped, but every box has left the port. Taking an average over the past few years it seems that about 15,000 boxes annually will cover requirements and that more than this proves the undoing of the trade. There is no evidence, however, that there is any likelihood of Canton recovering its former tea trade.
—*Diplomatic and Consular Report, China.*

THE RIVAL ARMIES.

Military Terms used and their Meanings.

A good deal of uncertainty exists as to the number of men comprising an army corps and a cavalry division in the different armies engaged in the European war. The following figures taken from the *Statesman's* year book may be taken as more or less correct.

Great Britain.

A cavalry division in war time consists of four cavalry brigades of three regiments each, two horse artillery brigades, 4 engineer troops, one signal squadron, 4 signal troops, 1 aeroplane squadron, 1 cavalry train and 4 field ambulances; total establishment 486, officers, 9,410 other ranks, 10,195 horses 24 guns. A division consists of three infantry brigades of four battalions each, four field artillery brigades (1 howitzer) 1 heavy battery, 1 ammunition column, 2 companies of engineers, 1 signal company, 1 squadron of cavalry, 1 aeroplane squadron, 1 divisional train, 3 field ambulances; total establishment 598 officers, 18,075 other ranks, 6,161 horses, 76 guns. "Army troops" include two mounted brigades, each consisting of either one cavalry regiment and two mounted infantry battalions, or two cavalry regiments and one mounted infantry battalion with one horse artillery battery, one ammunition column, one signal troop, one train and ambulance. All batteries have six guns, except the heavy batteries, which have only 4. The war establishment of a cavalry regiment is 25 officers, 537 other ranks, 562 horses, in three squadrons. The war establishment of a battalion of infantry is 29 officers, 995 others ranks, is eight companies. There is no mention of any army corps, but probably two divisions would constituete an army corps. With regard to the Indian forces a division in the field consists of 3,708 British and 9,168 native troops, total 12,876 with 30 guns. This includes one British brigade and two brigades of native infantry, one regiment of native cavalry and the usual battery, signaller, ambulance companies, &c.

France.

In France two infantry regiments make a brigade, usually six, but sometimes 7 or 8 battalions; two brigades a division, and two divisions, an army corps. French batteries have only 4 guns each. Each division has a Field Artillery Regiment of nine batteries' (36 guns) while the corps artillery consists of nine field and three howitzer batteries, altogether 30 batteries to the corps. In addition there are six reinforcing batteries to each corps, which only exist as a cadre till mobilization; if they can be placed rapidly on their war footing, it gives a total of 144 guns to the corps. To an army corps in the field are also attached a cavalry brigade of two regiments, one chasseur battalion, some companies of engineers, etc. There are also 42 heavy batteries of two guns each to be distributed among the army corps. A cavalry division is nominally composed of three brigades of two regiments each with a division of horse artillery of two batteries, in all 24 squadron and 12 guns. The mobilised strength of a normal army corps would be nearly 33,000 combatants. The strength of a cavalry division of six regiments would be about 4,700 combatants.

Russia.

The fighting strength of an army corps may be taken as 36,000 men without a cavalry division, and 40,000 if a cavalry division is included. The normal army corps consists of two divisions (two brigades of two regiments of four battalions), a howitzer division, a sapper battalion, and in the case of several army corps a cavalry division. Field batteries have eight guns each,

horse artillery six. A cavalry division consists of 2 brigades of 2 regiments (one Uhlans and Hussars, the other of Dragoons and Cossacks) and 2 batteries of horse artillery.

BELGIUM.

The strength of a division is about 22,000 combatants. The cavalry divisions each contain three brigades of 2 regiments, and 3 batteries of horse artillery; strength about 4,000 combatants.

GERMANY.

Two regiments of infantry (6 battalions) form a brigade, two brigades a division and 2 divisions an army corps. Ten divisions, however, have 3 brigades. These latter are doubtless to form reserve brigades. The war strength of a complete division of two brigades without reserve units is about 14,000 combatants and of an army corps of two divisions about 30,000. The strength of a 3 brigade division would be about 2,1000, and of an army corps of 6 brigades about 43,000 combatants. The normal strength of a cavalry division is 3 brigades of 2 regiments each, with 2 or possibly 3 batteries of horse artillery, in all 24 squadrons and 8 or 12) guns.

AUSTRIA.

Each army corps has about 34,000 combatants and each cavalry division about 4,000 combatants. An army corps consists of 2 divisions of the Common army, one regiment of field artillery of field howitzers, 1 pioneer battalion, 1 bridging company, etc. Each division consists of 2 brigades, each of 8 battalions, 1 artillery brigade (10 batteries of 6 guns each), a regiment of cavalay and a rifle battalion. A cavalry division consists of 2 brigades of 24 squadrons, 3 batteries of horse artillery and one machine gun detachment.—*Ceylon Observer*

GROUNDNUTS.

The expansion of the groundnut trade, which has been general throughout the Madras Presidency, has resulted in larger shipments from Pondicherry as well as from British ports, as shown in the following table:—

	Shelled.	In Husks.
	Bags.	Bags.
1908	538,166	55,924
1909	867,055	103
1910	1,041,696	80,206
1911	959,277	236,134
1912	1,053,327	164,636
1913	1,242,946	123,103

Although a very large portion of the kernels exported from Pondicherry are grown in British territory, this produce is nevertheless by far the most important factor in the prosperity of the colony, and the results of recent years must have been very profitable to the *ryots* (growers). Notwithstanding the increased supply of nuts, the demand has fully kept pace with it and prices have ruled very high, from 30 to 40 rupees per French candy equal to 3 bags of 80 kilos, each), and on average land as much as 1,500 to 1,600 kilos of unshelled nuts per acre may be raised, equal to about one-half of five-eighths of that weight of clean kernels, according to quality.—*Diplomatic and Consular Reports. France.*

CORRESPONDENCE.

8th September, 1914.

Tea Query.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—Can any of your readers kindly tell me if there is any harm from a London market point of view in making a large percentage of Pekoe, when no B. O. P. or O. P. is made but only a B. P.? The percentages of each grade I now make work out :

Broken Pekoe	...	42%
Pekoe	...	35%
Fannings and Dust	...	10%
Broken Tea and Pekoe Sou.	...	13%

I find I get a really good appearance in both top grades, which would be sacrificed were I to cut more and have less percentage of Pekoe. My only fear is that there may not be such a good market for big leaf grades as for small and that consequently it might not pay to make a really good Pekoe when the quantity of B. P. is thereby affected.

Yours, etc.,
"TEA SIFTER."

Seaforth Plantations, Ltd.,
Prospect, Naduvatam, Nilgiris,
13-9-14.

Indian War Fund and Coolies.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—On Thursday last, I called up my maistries on this group and explained as well as I was able the state of the war, adding that both English and native troops were now giving their lives to protect the English and Indian Empires and that I thought after their Rajah's fine example, they might give something themselves to the Indian War Fund and also see if their coolies would do the same. Next day they brought word that EVERY coolie on these estates would give one day's pay, the result being that between the staff and the labour force I was able to send Rs. 415 to the fund. If other tea estates did the same it would help quite materially I venture to think.

Yours faithfully,
COLIN HINDLEY.

VOLUNTEERS AND THE WAR.

TO FLETCHER NORTON, ESQ.,
Secretary, United Planters' Association, Southern India,
Bangalore.

1326 at request Richardson, Chairman your Association, I inform you that Madras Government will not, except in gravest circumstances, insist on volunteers serving outside district in which they ordinarily reside.—Chief Secretary.

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,

The United Planters' Association of Southern India,

BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED,

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

Before this paper reaches our readers we hope that both Mr. Aylmer Martin and Mr. Day may have arrived in Bangalore. But this will depend on whether their ships can come to Colombo, or through the activity of a German cruiser, they may have to go to Bombay; in which case there must be an unavoidable delay of a day or two.

We hope that those who have not yet paid in their first call towards the Labour Department will do so when this catches their eye.

There has been no desire on the part of the Committee to bring pressure to bear on those guarantors of the Fund, who have been hampered financially from answering the first call, as the unfortunate predicament in which many have been placed is fully recognised. But it would be a very pleasurable feeling for the Secretary if he could hand over to the new Director of the Labour Department, a well plenished chest. We hope those who have not replied to the first call will now respond at once.

Mr. Anstead, Scientific Officer, is also a fellow passenger on the 'Worcestershire" with Mr Day.

The Manager of the National Bank, Madras, informs us that by advice received from the Head Office, London, the profits for the half year to June 30th, amounted to £210,400 and that the Directors have declared an interim dividend at the rate of 12% per annum, carrying forward £1,50,400.

The article on Tea Pruning by Dr. Hope will, we hope, be found interesting by the Tea Planters of Southern India.

The Fishery Department of Madras will yearly fill a large space and want in Planting Industry so we publish an article from the Bulletin of the Imperial Institute.

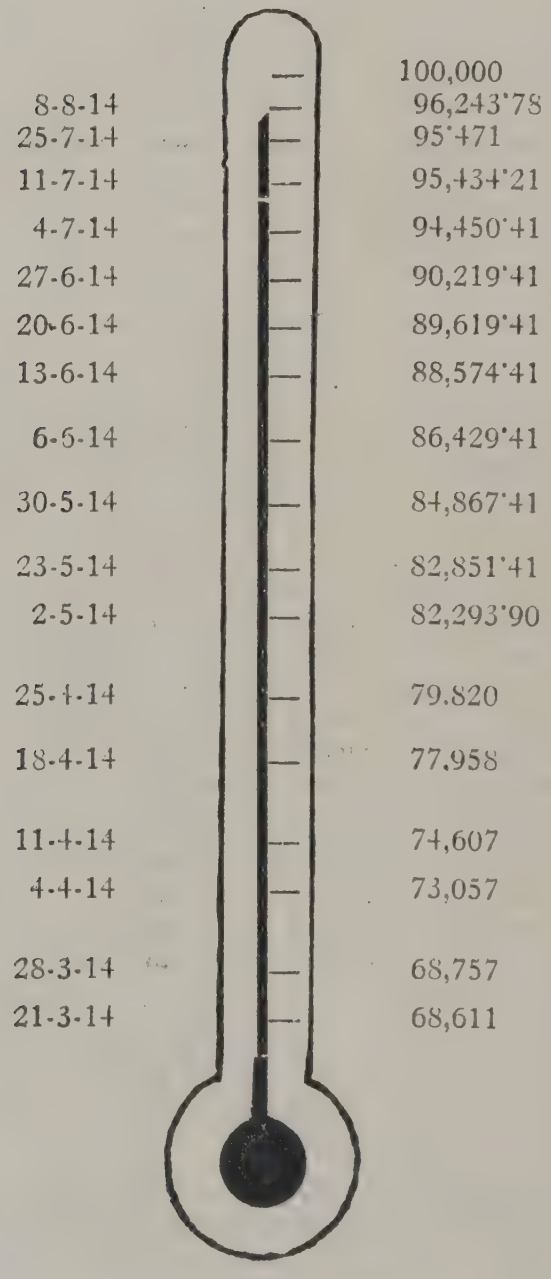
IMPERIAL INDIAN RELIEF FUND.

Previously acknowledged	...	Rs. 175
This week, Mr. C. Danvers	...	„ 25
Mr. H. G. Bonner	...	„ 25
		Rs. 225

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

TEA PRUNING.

From a fully attended meeting of the Darjeeling Planters' Association held last August, we extract two very interesting addresses from Dr. Hope and Mr. Tunstall which we hope will be found equally interesting to the Tea Planters of Southern India. In this week's issue we can only find space to publish Dr. Hope's address on pruning in different parts of India, Java and Ceylon, and the various methods adopted in each country to suit climatic conditions, and the conclusion at which he arrives. No general law can be laid down for pruning, but we can all recall to mind instances whose almost incalculable temporary damage has been done by the too liberal use of the pruning knife. Dr. Hope does not confine himself to pruning alone but speaks of the value of manure, extensively used, as tending largely to reduce the prevailing damage done to bushes by pests and blights. The necessity of manuring highly, and yet with discrimination, is very marked. The scarcity of Labour is touched on. In next week's issue we hope to publish Mr. Tunstall's address on Spraying, which should interest both Tea and Coffee Planters more especially the latter who are spraying against Green Bug.

Dr. Hope addressed the Darjeeling Planters' Association meeting as follows:—

My tour last cold weather in Java, Ceylon and Sumatra, about which I have already had the opportunity of telling you something, brought before me very clearly the great differences which exist between the conditions in this tea growing district and those which obtain elsewhere, and gave me certain ideas as to how such different conditions must modify garden work. Mr. Tunstall's experience of the different tea growing districts of North-East India have impressed the same facts on his mind. Consequently, when drafting the programme of the work of the Scientific Department for this year I thought that it might be of use if we were both to meet you here in order to present to you a joint address embodying suggestions as to modifications and improvements, which we think might be made in order to counterbalance some particular disadvantages which are due to your climate and situation.

I need not discuss wherein the differences in condition lie nor their cause, they are sufficiently well known to you, but I will pass on at once to make certain practical suggestions about pruning and manuring and Mr. Tunstall will then discuss the question of spraying.

In discussing pruning in this district as it may affect the bushes in their present indifferent condition, it may be of value to compare the methods adopted here with those carried out in the plains of India and in districts of similar elevation in Java and Ceylon, taking into consideration the effect which climate may exert in each case.

It is hardly necessary to draw attention to the difference between the growth of bushes in this district and in the plains, be it in the Dooars, Terai, Assam, Cachar, or Sylhet. In both cases the definite cold weather, accompanied by drought in the winter months, and later, in the spring, when the temperature is higher, drought alone, causes a cessation of growth for several months. Apart from this the mean temperature of the district is a controlling factor in the total amount of growth. The mean temperature of places in this part of India, though it cannot be so closely correlated with their height above sea-level as in Java and Ceylon, is nevertheless roughly dependent thereon. Consequently, at lower elevation and on the plains the

total growth of bushes is greater than at higher elevations on account of the higher temperature.

In Java, at the highest elevation where tea is grown, bushes are pruned once in about two years at lower elevation more frequently. Pruning is there carried out at all seasons for there is a comparatively uniform climate through the year but an effort is made to confine it as far as possible to the short but definite periods of dry weather which occur at different times, for then less growth is taking place and there is less likelihood of the cut surfaces of branches bleeding after pruning. This is very much the method adopted in Ceylon but there, at the highest elevation where the temperature is low and growth consequently slow, for example on the tea estates in the neighbourhood of Nuwara Eliya, the period between successive prunings may be as long as four years.

In these two countries there is no definite cold weather such as is experienced in India, and droughts of sufficient severity to check the growth of bushes are of comparatively short duration. The bushes are consequently in a state of more or less active growth all through the year, and though probably the rate of growth is never at any one time so rapid at places of the same elevation as it is at certain times of year in this district, yet the total growth throughout the year is in most cases, and certainly at the higher elevations, greater than in places of like elevation in India.

We are thus led to the conclusion that the total annual growth of tea bushes in this district is less than at similar elevations in Java and Ceylon, and very considerably less than in the gardens in the plains of India. A comparison of crop returns and a knowledge of the amount of growth removed in pruning is alone sufficient to demonstrate this fact.

And yet in this district, although probably in most cases a larger percentage of the whole area of estates is left unpruned each year than on estates in the plains of India, pruning is carried out with twice to four times the frequency with which it is done on gardens at similar elevations in Java and Ceylon.

After careful consideration of the relative climatic conditions under which tea is grown in this and other districts, I have come to the conclusion that successive prunings of bushes are carried out on the estates at high elevations in the Darjeeling district, more frequently than is either necessary or desirable.

There are, of course, exceptions to this general statement, for I know of several gardens where a third or more of the total acreage is left unpruned in each year. This procedure is to be commended at high elevations.

Too frequent pruning is weakening to the bushes themselves and accounts I think largely for the relatively poorer development of wood on bushes here than in other districts, and for the immeasurably greater harm done to the bushes by pests and blights.

This is not the occasion to repeat the arguments which are put forwared fully in a pamphlet on "some aspects of modern tea pruning" which is about to be published, because I hope that you will consult our views on pruning as expressed therein, in connection with what I am now saying, but I must emphasize particularly here, in this district, that

pruning, necessary as it is as a garden operation, weakens bushes, and in districts where owing to climatic influences growth is naturally slow, pruning should be carried out less frequently than in districts where wood removed in pruning is replaced more quickly.

I think therefore that a system should be adopted for high elevation gardens of leaving bushes unpruned in alternate years and alternately light pruning and cleaning or thinning them out in the years when they are pruned. In lower elevations bushes should be left unpruned once in every third year, top pruned with thinning or cleaning out in the following year, and light pruned in the third year.

Such systems, or modifications of them, would, I believe, be admirably suited to Darjeeling conditions, if concurrently spraying and heavy manuring were carried out as part of the general garden work.

The advantages which follow such system are several.

In the first place the plucking throughout the year is always more easily controlled and the production of the crop better distributed when a considerable part of the total area of tea is left unpruned, for the unpruned tea yields the bulk of its crop early in the season and then the pruned bushes can be allowed good growth before being regularly plucked, and towards the end of the season when the unpruned tea has yielded its crop the attention of the labour force can be devoted to the careful plucking of the pruned tea.

The most decided advantage however from leaving a large area unpruned is in connection with the general strengthening of the bushes and the thickening up of the shoots which are going to be pruned at the end of the year. This is the all-important question in this Darjeeling district.

In considering how the remainder of the area should be pruned I must again draw attention to the pamphlet on pruning which I have just mentioned. When you read it you will at once recognise that it was not written with special reference to the conditions which generally obtain in this district, but that it refers more particularly to the pruning which is possible on well-laboured gardens in the plains where the bushes are healthy and vigorous and free from pests and blights. However, the principles of pruning laid down in this pamphlet apply to all tea bush pruning, and it is my object in addressing you now, and my duty, to point out to you how these principles can be adhered to in practice in this district so as to give the best results. This necessitates certain modifications of the methods which we have suggested for pruning on estates in the plains.

In the first place as I have said, pruning should be carried out less frequently.

Secondly, when pruning is carried out the object should be to produce fewer but stronger branches than are usually found on bushes in this district. The methods of pruning which are described in the pamphlet I have alluded to under the names of thinning out, spacing out, and cleaning out, are of special value in reducing the attacks of pests and blights, and the reason for this lies in the greater vigour of growth which is developed by branches of bushes which has been pruned in one of these ways, and this increased vigour of growth is the result of less competition with other branches and twigs for available nourishment. The importance of carrying out one or other of these methods of pruning where possible cannot be over

estimated, and if carried out they will tend to reduce the attacks of pests and blights and will also make heavy pruning less often necessary.

The Department has been charged with advocating as an isolated policy quite unconnected with any other garden operation heavier and more drastic pruning as a remedy for the innumerable pests and blights which occur on the tea in this district. This is not so. No recommendation with regard to to any particular garden operation would be put forward by officers of this Department without carefully considering what modification of other garden operations might be necessary as the result of it. What this Department does suggest is that pruning in this district requires modification in two directions. Firstly, pruning should be carried out less often, and secondly when carried out, it should be done more carefully, if necessary more expensively and certainly more scientifically. Moreover the bushes which are pruned in this way should be manured and sprayed so as to invigorate them as far as possible and enable them to replace numberless useless twigs by a few really useful healthy branches.

Given vigorous bushes spraying and pruning are the two chief direct means of keeping them free from attacks of pests and blights but as the pruning which I have indicated as being that best adapted to this end cannot be carried out, for reasons I have given, so frequently in this district as elsewhere, spraying as an additional means of keeping bushes in a healthy condition should receive greater attention here than in districts where clean pruning can be carried out regularly and frequently. Mr. Tunstall will deal with the question of spraying in its practical details when he addresses you.

This Department, then, puts forward the methods I have just referred to as the only practical policy to adopt to improve what must be admitted to be the very unsatisfactory condition of a great deal of the tea if not of whole estates in the Darjeeling district. I quote Ceylon as an example of what extensive and expensive manuring can do, combined with reasonably good, though by no means intensive, cultivation and careful though by no means scientific pruning. Similar results might be expected in this district if we were to go in for a system of heavy manuring as good cultivation as labour conditions permit of, spraying, and really scientific pruning, with a proper understanding of the inter-dependence of these operations, the necessary labour for the last operation would be available if the area pruned in each year were limited.

Though I am making a statement which I know to be contrary to the opinion of several leading planters in this district, I register it emphatically as the opinion of this Department that the extensive use of manures of all kinds, including imported artificials would tend very largely to reduce the prevailing damage done to bushes by pests and blights.

The use of manures is, I believe, feasible and is urgently required in this district and will come about sooner or later. Manures are being increasingly used on all go-head estates in Assam with results which put aside all doubt as to their general usefulness.

Those who differ with us in this opinion bring forward arguments which are not without considerable weight to support their contention that manuring with artificials can never pay in this district. They speak of the cost of manures themselves, of the heavy freight, of the cost and labour involved in applying them, of the effect applications of manures may have on the growth of jungle already prolific enough on most estates. They argue that large expenditure per acre cannot be incurred on tea which is at present giving only a small profit per acre and so on,

Against these arguments I would bring forward the following counter arguments.

There is no tea district I have seen in India or elsewhere where the bushes have such feeble growth or are so obviously weakened by pests and blights as the Darjeeling district. The fault of this lies not entirely with the climate and soil. It is largely due to neglect in the past but partly I think to incorrect and inadequate treatment of the soil and bushes now, though this is becoming less so every year and garden work is being improved in every direction.

In Ceylon at similar elevations bushes are incomparably more vigorous and this is not due to better cultivation or to more careful prevention of loss of surface soil by wash, for the former is if anything inferior to what is done here and neglect of the latter has been one of the most obvious and disastrous mistakes in Ceylon planting, but it has been due to the extensive and intensive use of manures combined with a proper understanding of the effects of pruning at different elevations. Since manuring has become general in Ceylon pests and blights with but few exceptions have done comparatively little harm.

In Java the bushes are likewise much more vigorous than in Darjeeling and though manuring has not been a factor in this case, this is no argument against the use of manures in this district for the Java planter has from the very first realised the importonce of retaining his rich surface soil and has done admirable work with this end in view and continues to do so.

In Ceylon where manures are used at high elevations, freight is a factor of considerable importance but the use of manures is not checked thereby. I have figures which show that in this district the freight paid on manures would add a very few annas more to the cost of manuring per acre, than that paid at similar elevations in Ceylon.

Increased cultivations and the carrying out of expensive work directed towards the prevention of wash would undoubtedly go very far towards bringing about the results which we wish to obtain but this is not the time for bringing forward any suggestions for garden work which are so directly dependent for their execution on the total amount of available labour. The paucity of labour and therefore of means for carrying out intensive or even adequate cultivation on many Darjeeling Estates is one of the strangest arguments we can bring forward for the use of other means of increasing the vigour of bushes—means which do not necessitate the employment of so large a quantity of labour as would be required to bring about the same result by cultivation alone.

Labour is scarce but money for the purpose of manuring would be readily available once the necessity for and value of manures were recognised.

Finally, if manuring gives the results it has given on tea estates elsewhere, and there is no reason why it should not do so if it be carried out correctly and with due attention to the special conditions which obtain here—the cost of the materials will be more than covered by the money value of the benefits directly traceable to their use, be these in the form of increased crop, improved frames or greater immunity of the bushes from pests and blights. Even if the direct money return only equals and does not exceed the expenditure, manuring is justified on the ground that it is increasing the capital value of the estate.—*The Indian Planters' Gazette and Sporting News.*

FISHERY DEPARTMENT.

Fish Oils and Guano from India.

The preparation of sardine oil and guano forms an important part of the experimental work of the Madras Government Fishery Department. Hitherto such work has been carried on at the Cannanore Experimental Station, but during 1911-12 it was transferred to the Experimental Station at Tanur, where fish are usually more abundant. At first crude brown oil only was prepared, but as there is a better market for the finer grades of fish oil, new machinery has been installed at Tanur for producing pale-coloured oil, for separating the "stearin," and for refining the oil, whilst deodorising experiments are also to be conducted there. The efforts of the Department to create a local fish-oil industry have been highly successful; in 1909 there was only one private factory, whilst at the beginning of the 1911-12 season between forty and fifty small factories were producing crude brown oil in Malabar and South Canara, and it seems probable that factories will also be started in Cochin and Travancore.

As the supply of fish along the coast fluctuates considerably, and the amount of oil in the fish varies in different seasons, it is suggested that a large number of small factories is preferable to a small number of central factories. Attempts have also been made to devise methods suitable for use by single native families, in order to establish a kind of cottage industry.

In the small factories where crude brown oil is being produced the methods followed are of a simple kind. The fish are boiled in open pans, holding one-half or two-thirds of a ton, and the resulting mass is placed in coarse coir bags and pressed in simple screw presses. The pressed cakes of guano are broken up and placed on mats in the sun to dry. The crude oil is stated to fetch Rs.160 (approximately £10 10s.) per ton of about 250 gallons at the factory, the middleman supplying the casks and bearing the cost of transport; the guano realises about Rs. 70 (approximately £4 10s.) per ton.

Several samples of the sardine oil and guano made in Madras have been received recently at the Imperial Institute from the Madras Government Fishery Department, and as the results of their examination are of general interest, they are now published,

Sardine Oil and Stearin.

Seven samples of sardine oil and one sample of stearin obtained from sardine oil were received in August 1912. They were as follows:—

1. "Palest oil from Cannanore".—A pale yellow oil, which deposited stearin on standing.

2. "Palest oil without stearin".—This was a bright yellow oil, clear when received at the Imperial Institute, but, like the other samples designated "oil without stearin" (Nos. 4 and 6), it deposited stearin to some extent at the temperatures commonly prevailing in Europe, viz., up to 20° C.

3. "Palest oil with stearin."—A yellow oil with a deposit of stearin.

4. "Yellow oil without stearin."—A pale brown oil.

5. "Yellow oil with stearin."—A pale brown, viscous oil.

6. "Brown oil without stearin."—Thick brown oil, possessing an unpleasant odour.

7, "Brown oil with stearin".—Dark brown semi-soiled oil, possessing an unpleasant odour.

8. "Stearin".—Pale brown, soft fat.

The samples were examined with the results shown in the following table: No. 7 contained about 3·2 per cent. of water, which was removed before the constants were determined:

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6	No. 7	No. 8
Specific gravity at 100° C/15° C...	0·878	0·877	0·877	0·877	0·876	0·876	0·875	0·874
Acid value ...	3·7	2·3	1·8	4·7	7·1	35,0	53·5	9.0
Saponification value ...	196	194	194	193	198	199	200	198
Iodine value *per cent.* ...	154	156	157	159	154	157	157	131

Milligrams of potassium hydroxide per gram of oil.

The general characters and constants of these sardine oils indicate their suitability for the usual purposes to which fish oils are applied, *viz.*, leather dressing and currying, and to a smaller extent for soft soap manufacture, tempering steel, admixture with paint oils, and jute batching. The stearin would also be suitable for use in leather manufacture and soap making.

The various fish oils used in commerce (*e.g.*, cod, herring, menhaden, Japanese sardine and shark liver oils) differ a good deal from one another in physical and chemical characteristics, but they all have a high iodine value. This constant is of great importance, as it indicates the readiness with which an oil will undergo oxidation, a property on which the value of an oil for leather dressing largely depends.

The principal fish oil used in the leather industry of the United Kingdom is cod oil, commercial specimens of which usually have an iodine value of about 155. It will be noticed that the iodine values of these sardine oils from Madras (*viz.*, 154 to 159) approximate very closely to this figure.

With the exception of the brown oils (Nos. 6 and 7), all the samples had low acid values and appeared to have been carefully prepared. The somewhat high acid values of the brown oils would reduce their value for leather dressing, as such oils are usually regarded as unsatisfactory for this purpose.

Two further samples of fish oil were submitted for examination, in February, 1913.

No. 9 "Brown oil with stearin."

No. 10 "Brown oil without stearin."

These oils were dark brown in colour and had a very unpleasant odour. They were filtered, and then chemically examined with the following results:—

	Brown oil with stearin.	Brown oil without stearin.
Specific gravity at 100° C/15·5° C..	0·881	0·879
Acid value ...	12·1	11·8
Saponification value (*approx*) ...	200·2	200·0
Iodine value *per cent.* ...	155·2	154·1

The constants of these two oils correspond on the whole with those of the previous samples.

The present specimens have much lower acid values than the two samples of brown oil (Nos. 6 and 7) then dealt with, but they were darker in colour and their odour was still more unpleasant.

The remarks made above as to the uses of the oils are also applicable to the present samples.

FISH GUANO.

The following samples of fish guano were received along with samples Nos. 9 and 10 above:—

No. 1. "Fish guano prepared at the Government Fisheries Station, South Malabar."

No. 2. "Fish guano prepared at the Government Experimental Station at Tanur, South Malabar:" (*a*) "Ordinary guano" (*b*) "Guano from large oily sardine."

The guanos consisted of fragments of the bones, flesh, and scales of small fish. They were examined with the following results:—

	No. 1. *per cent.*	No. 2a. *per cent.*	No. 2b. *per cent.*
Moisture	7·86	8·82	8·68
Crude proteins	49·22	53·65	56·40
Consisting of:			
True proteins	43·75	45·41	49·06
Other nitrogenous substances.	5·47	8·24	7·34
Fat	6·69	5·38	8·52
Other organic matter	7·37	4·73	5·01
Ash	28·86	27·42	21·39
The Ash contained:			
Lime CaO	33·10	42·32	42·12
Potash K_2O... ...	0·85	2·17	2·19
Phosphoric anhydride P_2O_5 ...	29·52	35·32	35·56

The following table shows the percentages of lime, nitrogen, phosphoric anhydride, fat and water present in these three samples of fish guano from South Malabar, compared with the corresponding figures recorded for fish manure from other sources:—

	Lime CaO.	Nitrogen N.	Phosphoric anhydride P_2O_5.	Fat.	Water.
No. 1 ...	9·6	7·3	8·5	6·69	7·86
No. 2*a* ...	11·6	8·6	9·7	5·38	8·82
No. 2*b* ...	9·0	9·0	7·6	8·52	8·68
Fish manure from refuse (United Kingdom) ...	—	7·8	8·1	—	18·9 not exceeding
Dried Menhaden scrap (U. S. A.) ...	—	8·0	8·5	—	12·0
Norwegian cod heads and bones ...	—	8·0	14·9	—	13·0
Norwegian whale manure..	16·5	7·6	13·4	—	5·3
Dried cod fish skins and bones ...	—	8 to 9	10 to 12	—	5 to 6
Canadian dogfish scrap ...	—	8·8	7·7	16·6	5·5
Brittany fish manure ...	—	6·5	13·1	—	5·0

The commercial fish meal sold in Europe as food for cattle and pigs contains the following proportions of the most important constituents :—

	Proteins Per cent.	Phosphoric anhydride. Per cent.	Fat. Per cent.
English meal from fish refuse ...	50 to 65	6·6 to 8·5	3 to 6
Norwegian codling meal ...	50 to 60	11.3 to 13.1	1 to 2
Herring meal ...	60 to 70	3.7 to 4.7	10 to 12

A comparison of the figures given in the table above for well-known commercial fish manures with those recorded for the present samples of fish guano from South Malabar shows that the latter contain about the same percentage of nitrogen as the other manures and an average amount of phosphoric anhydride, and there is therefore no doubt that they would be readily saleable as fish manures.

These Indian fish guanos are not quite so rich in proteins as the fish meals mentioned in the table on p.54. They contain, however, average quantities of phosphoric anhydride and fat, and would no doubt be readily saleable for the preparation of feeding-stuffs of the fishmeal type, provided they are prepared from fresh fish and are kept in good condition.—*Bulletin of the Imperial Institute.*

Industrial uses of Infusorial Earth.

According to information recently published by the Department of Commerce at Washington, there has been increased activity in the mining of infusorial earth in California and Nevada, which produced nearly 90 per cent. of the total output of 6,528 tons last year in the United States. The value averaged 10½ dollars (about 43*s.*) per ton.

Heretofore, diatomaceous or infusorial earth has been largely used as an abrasive in the form of polishing powders and scouring soaps, but the United States Geological Survey finds that of late its uses have been considerably extended. Because of its porous nature it has been used in the manufacture of dynamite as a holder of nitroglycerine. Its porosity also renders it a non-conductor of heat, and this quality in connection with its lightness has extended its use as an insulating packing material for safes, steam pipes, and boilers, and as a fireproof building material. In the United States a new use of the material is reported in the manufacture of records for talking machines; for this purpose it is boiled with shellac, and the resulting product has the necessary hardness to give good results.

In Europe, especially in Germany, infusorial earth has lately found extended application. It has been used in preparing artificial fertilisers, especially in the absorption of liquid manures, in the manufacture of water glass, cements, glazing for tiles, artificial stone, ultramarine and various pigments, aniline and alizarine colours, paper, sealing wax, fireworks, gutta-percha objects, matches, solidified bromine, scouring powders, papier-mache, and many other articles. In consequence, there is a large and steadily growing demand for this product.—*The Board of Trade Journal.*

Contre la Malaria. (The Malaria Campaign.)—Bulletin Association, *Planteurs de Caoutchouc, Antwerp*, vi, No. 2, March, 1914, p. 30.

According to Dr. Watson, Sumatra, owing to the scarcity of *Anopheles maculatus* there, is markedly free from malaria as compared with the Federated Malay States.—*The Review of Applied Entomology.*

FRUIT TREES.

Manuring Fruit Trees.

For maintaining fruit trees in bearing, in health and vigour, and enabling them to bear heavy crops of fruit, it is essential that they be properly nourished.

In practice, this is generally ensured by applications of fertilisers.

In order to better understand the subject, it is worth the fruit grower's while to unearth this knowledge himself, in his own orchard.

There are three ingredients which need to be furnished through the medium of fertilisers—namely, potash, phosphoric acid, and nitrogen. The remaining essential plant food constituents are usually present in the soil in abundant quantity, and need not be supplied. Adverting to these three important constituents, it is generally safer, when the fruit grower is not properly conversant with the tree's requirements on his particular land, to apply all three. A one-sided manuring is not a profitable manuring, and is not productive of the best results.

In order to ascertain the requirements of fruit trees in his orchard the fruitgrower is recommended to experiment; in other words, manure certain rows of trees in the orchard with different manurial dressings, and closely observe the results with regard to yield, size, colour, appearance, flavour, and keeping qualities of the fruit produced, and also the appearance, vigour and disease-resistant properties of the trees, and, not the least important, the profits accruing from their application.

The beginner should remember that potassic fertilisers supply potash; phosphatic fertilisers, phosphoric acid; and nitrogenous fertilisers, nitrogen respectively.

Examples of potash fertilisers are—
Sulphate of potash, and
Muriate of Potash.

Those of phosphatic fertilisers—
Superphosphate,
Basic Slag, and
Bonedust.

The last-named also supplying a little nitrogen, while
Sulphate of Ammonia and
Nitrate of Soda
may be cited as examples of nitrogenous fertilisers.

Supposing a fruitgrower is desirous of ascertaining whether fruit trees on his land will respond to potash, all he need do is to apply a phosphatic and nitrogenous fertiliser to a number of trees and make a note of it. Such a dressing is known as incomplete fertiliser, as it does not supply all the three important plantfood ingredients. To an equal number of trees of the same age, variety and size, on similar land, he should apply the same amounts of phosphatic and nitrogenous fertiliser, plus, say 1 to 2 lb. sulphate of potash per tree.

Similarly, if a grower desires to find out if it will be profitable to apply phosphatic or nitrogenous fertiliser, he may proceed on similar lines, omit-

ting the particular fertiliser which he needs the information about from the dressing, in one case, be it phosphatic or nitrogenous, and including it in another. In this way the fruitgrower may observe the behaviour of the trees towards the particular kinds of fertilisers,

Fruit crops are unlike most farm crops, in that the effects of the fertilisers are not so readily observable, and the beginner needs to be warned against expecting outstanding results the first season. The second and subsequent seasons, however, good results may follow rational manuring.

Mr. Alfred Thiessen, of Geeveston, Tasmania, laid down experiments on the three-plot system in the spring of 1912 with apple-trees. The trees on the No. 1 plot were left unmanured, those on No. 2 received—

3 lb. superphosphate,
2 lb. bonedust,
½ lb. sulphate of ammonia.
1½ „ sulphate of potash,

per tree, and those on No. 3 received

3 lb. superphosphate,
2 lb. bonedust,
½ lb. sulphate of ammonia.

The yields, calculated per acre, for the first season were:—

Plot 1, 560 cases.
Plot 2, 800 cases.
Plot 3, 666 ⅔ cases.

The past season's results (being the second year of experiment) were:—

Plot 1, 524½ cases.
Plot 2, 1,022¼ cases.
Plot 3, 915 cases.

The absence of fertiliser on plot 1 accounted for considerably lower yields. The trees on plots 2 and 3 each received the same amounts of superphosphate, bonedust and sulphate of ammonia. Those on plot 2 were given 1½ lb. sulphate of potash in addition.

The difference in yield, and consequently the money value, between the two plots was well marked, and showed that the complete fertiliser was the most profitable one.—"The Fruit World."—*The Queensland Agricultural Journal.*

Tea.

No public sales have been held during the week, and the private market has been practically closed, as merchants were not prepared to quote prices during a period of exceptional uncertainty. Next week the public sales of Indian and Ceylon will be resumed, and it will only then be possible to give any idea of the trend of the market. It is reasonable to anticipate higher prices for all liquoring kinds, as a considerable business has been done during the week, and stocks on the spot are to a certain extent reduced. Low priced Monings from 7*d.* to 10*d.* are worth attention, as many of the teas have clean pure liquor, and can be used with advantage during the period of high prices.—*The Produce Markets' Review.*

PLANT PESTS.

Protection against Plant Pests.

The Rome Convention.

The object of the Rome Convention is to bring about by legislative and administrative measures between the countries adhering to the Convention mutual and effective action to prevent the introduction and extension of plant pests.

In order to carry out this object the Convention contemplates (1) State inspection of nurseries, gardens, hothouses and other establishments devoted to the trade of living plants (plants, cuttings, grafts, bulbs and cut flowers). (2) State regulation of transport and packing of plants. (3) The establishment in each of the adhering countries of a Government department of Phytopathology, to give effect to inspection, to control transport and to issue certificates; and (4) the foundation of one or several research institutions in which the scientific and technical investigation of plant pests shall be conducted.

Thus Article 5 of the Convention provides that living plants in the sense already indicated—may be imported only if they are accompanied by a phytopathological certificate issued by competent officials of the exporting country. The Committee is anxious to know whether a phytopathological certificate issued by a responsible body will suffice to allow of the introduction of living plants from a country which is not a signatory to the Convention. It is no less anxious to know whether this Article prevents the importation of plants from a "non-contracting" State. If it is shown that adhesion to the Conference does not limit nor prevent the importation of plants from non-adhering countries the Committee is prepared, subject to one other proviso, to recommend that this country join the Convention. This proviso is that cut flowers shall not require to be accompanied by a certificate of freedom from plant pests. For, in the opinion of those engaged in the cut-flower industry, to require a certificate with each consignment of cut flowers would destroy the import trade. It is to be observed that the question whether such a destruction of the import trade in cut flowers is or is not desirable lies outside the reference to the Committee. The Rome Convention has for its purpose not an examination or change in fiscal policy, but the reduction of the enemies of vegetation. Hence the Committee had only to consider whether the introduction of cut flowers is likely to spread plant diseases. They were of opinion that it is not, and recommend, therefore that cut flowers shall be excluded from the scope of the Convention.

The net result of the deliberations of the Committee is that the Horticultural branch of the Board of Agriculture has undertaken to obtain the official views of the Convention on the points above indicated.

The Committee in its written expression of opinion has added two riders which are of importance. It recommends, in the first place, that negotiations should be entered into between this country and the Dominions, etc., with the object of establishing a phytopathological convention within the Empire in order to facilitate trade between the home country and the Dominions and Dependencies, and in the second place it advises that, in the event of the Rome Convention meeting again, or in the event of a similar Convention being summoned, British representatatives should include persons interested and engaged in horticultural trade.

Informed opinion will agree that the Committee has acted wisely in making sure of the nature and scope of the commitments involved by adhesion before recommending this country to join the Convention.—*The Gardeners' Chronicle.*

LIME.

A "New Kind of Lime."

Some time ago Professor Hendrick, Aberden College of Agriculture, lectured before the Scottish Section of the Society of Chemistry industry, Glasgow, on "The Agricultural Value of Carbonate of Lime Recovered from causticising plant." Quantities of precipitated chalk, it appears, is produced as a bye-produce in the causticising plant of paper works and practically the whole of this at present goes to waste. The only substance according to the analysis of this bye-product, which may be agriculturally taken into consideration is its 60 to 90 per cent. of calcium carbonate with a little calcium hydrate. This is by no means a "new kind of lime" and as a matter of fact, this lime is in many instances made use of by agriculturists who live in the surrounding neighbourhood of such works which produce it as a bye-product. When these works are situated in a part of the country where marl can be had, of course the bye-product of the paper works and other works is not made use of as most marls contain calcium phosphate as well as calcium carbonate and consequently is a much more valuable form of manure. Professor Hendrick referred to the use of lime in the soil and showed that large quantities of lime were constantly lost in drainage waters. This is a fact well known to tea planters, but as they do not use the artificial manures nearly to the same extent as they do at Home which cause this there will not be nearly the quantity of lime lost in the drainage waters of tea gardens as there will be where such artificials as sulphate of ammonia, for instance, are used. Sulphate of ammonia is used now by agriculturists at Home in enormous quantities and in consequence the professor's advice to them to use more lime as a manure, instead of using less as they appear to be doing, must appear to every one as being perfectly sound. Whether they use the carbonate bye-product of such works as produce it will entirely depend upon the distance of their farms from the place of production. Limes at Home is a comparatively cheap manure when we consider the enormous advantages derived from its use upon certain kinds of soils. Professor Hendrick reiterates what has been put forward time and again in these columns of *Topics* during the 1st three years that there is no good ground for the belief which is still common that it is necessary to use burnt lime (lime shells or ground lime) on the soil. Weight for weight of lime, carbonate of lime is, for most purposes, quite as effective as quick lime. Experiments are being carried out at Home at the present time and as far as they have gone they prove that (in time) the carbonate is equally as effective as the oxide. The burning, and the ultimate hydrating of lime, has the effect of reducing it to a finer powder than could be done otherwise in the absence of power and expensive machinery. This enables it to mix thoroughly with the soil and is brought in contact with a larger amount of soil particles than would be the case if it were added in a coarser mechanical state. Quick lime acts more quickly but in the same way as carbonate of lime. First, they supply the lime which all plants require as part of their food. As a general rule most soils contain an abundance of lime for the direct wants of the plants; it is therefore only in exceptional cases that lime will act in this way, Secondly, by combining with acids in the soil, so as to remove the sourness of the land, thirdly, by gradually acting on the vegetable matter of the soil, it converts the nitrogen it contains into an available condition for the plant's needs, and fourthly by acting upon the mineral matter of the soil so as to fit it for entering into the roots of growing plants. The presence of carbonate of lime has been proved to be one of the most important conditions of the process known as "Nitrification"

whereby the nitrogen in the form of organic nitrogen or ammonia, in the soil is converted into nitric acid.

Limestone.

Although most planters of experience know all about this, in many cases the younger generation of planters do not thoroughly grasp everything in its connection. I mention this in case any of the older hands might think that it is presumption on my part to attempt teaching them about what they perhaps know all about better than I do. There are a great many young assistants who have not had an agricultural education and who know nothing about lime or its agricultural functions, could teach me more other subjects than ever I dreamt of and it is for such I write concerning lime.

Limestone rock is seldom found absolutely pure. When it is so it consists of lime (quick lime) in combination with carbonic acid. Its chemical formula is CaO_3 which means that 56 lbs. of lime, and 44 lbs. of carbonic acid, make 100 lbs. of pure limestone. There are many varieties of limestone such as chalk which is soft, our common limestone which is hard. Some are yellow like those containing magnesia, some are pure white like marble. The Derbyshire black marble is a limestone and tney are all calcium carbonates. It is one of the simplest of experiments to ascertain the presence of lime in a soil by putting a little of it in a glass and pouring some hydrochloric acid upon it (vinegar will also answer the purpose), and if any effervescence appears it is a fairly sure sign of lime being present in the soil. The bubbling-up would be owing to the escape of the carbonic acid gas from the carbonate of calcium present in the soil.

When limestone is burned the carbonic acid is driven out by the heat and the lime remains. One ton of pure limestone yields about 11¼ cwt. of quick-lime. One ton of pure quick-lime becomes 26-1/3 cwt. of slaked-lime. Quick-lime, if exposed to the air, will absorb water from it and gradually fall into powder. It will also absorb carbonic acid gas from the air and again become a carbonate which is chemically exactly the same as it was in the original rock but its mechanical condition of course has entirely changed from that of being a more or less fine powder. When lime in any form is used as a manure it should never be put deeply in the soil as it has a strong tendency to sink and when it gets below the cultivation it is one of the main factors in the production of that objectionable state in a subsoil known by the name of hard pan. If a plateau garden requires the addition of lime for any other purpose than providing plant food it may almost be taken for granted that it should not have been opened in tea.—*Indian Planters' Gazette.*

Coffee.

The market has been practically closed, with the exception of a few dealings for cash, which are therefore hardly an indication of values. Foreign markets are also nominally closed, but business has been done in America at from 8*s.* to 10*s.* above the closing prices of last week, and it is quite possible that this market may show the same advance. At the same time there is plenty of Coffee in London for the home trade demand, and if shipments to the Continent are stopped for any length of time there need be no fear of a shortage, though for the present holders are asking a considerable advance. The Brazilian market is closed until the 15th instant, and instructions have been given to the railways there to send nothing to the ports; this will not help matters, as ignorance with regard to the movement of the crop will lead to more uncertainty.—*Produce Markets' Review.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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(INCORPORATED.)

Contents.

Both Mr Aylmer Martin and Mr. Day have arrived and all correspondence about labour matters should from to-day be addressed to him; except such letters as correspondents may wish to appear in the *Chronicle*, in which case, such letters should be addressed to the Editor, *Planters' Chronicle*, to avoid all complications.

Mr. Anstead, Scientific Officer, has also returned from his holiday. All three officers appear very much benefited by their visit home.

We publish Proceedings of the North Mysore Planters' Association. We recommend for reading the concise report read by Mr. Bonner on the co-operative purchase of manures.

There also are published the Proceedings of the Mundakayam Planters' Association. Mr. Kirk read his report as Delegate to the U. P. A. Annual Meeting and two resolutions were passed by a majority. The first was to approach the local Association with a view to establishing a more economical scheme (for labour) for protecting their interests than that established by the U. P. A. S. I.

The second resolution condemned the tempting of any of the native staff employed on any estate in the district by holding out higher pay.

A special meeting of the same Association's Committee was held to meet the District Magistrate, with a view to taking steps to prevent undue rising of prices of foodstuffs during the War.

A Tea Report is published up to date.

Those interested in Sisal Fibre cultivation will be interested in the extract from "Tropical Life" on Yucatan Sisal output.

From the Consular and Diplomatic Reports we extract an authoritative article on Rubber under the heading of Pará.

There will be a meeting of the Labour Committee in Bangalore on October 12th, and any suggestion that any one may wish to have brought before it should reach Mr. Martin before that date.

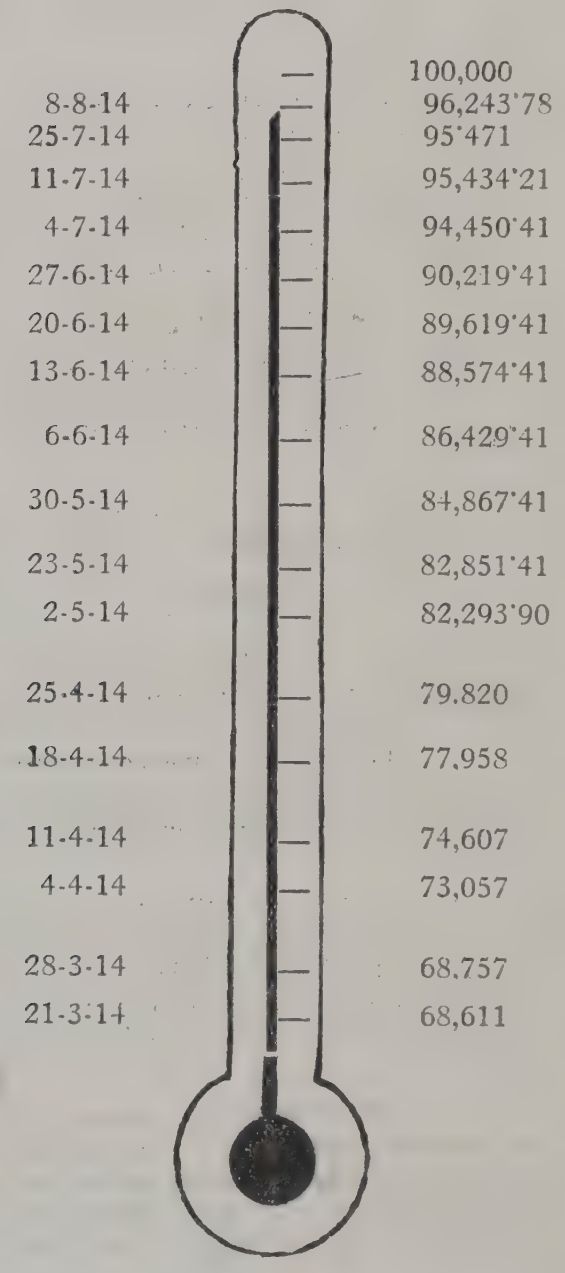
IMPERIAL INDIAN RELIEF FUND.

Previously Acknowledged ... ... Rs.225.

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

DISTRICT PLANTERS' ASSOCIATIONS.

North Mysore Planters' Association.

Proceedings of the Annual General Meeting held at Balehonnur, on 7th September, 1914.

PRESENT.—Messrs. H. G. Bonner, (President), C. H. Browne, A. F. Evetts, C. C. Kent, R. G. Foster, C. Danvers, F. W. Hight, C. P. Reed, E. H. Young, and W. H. Reed, (Honorary Secretary). By Proxy:—Mr. S. L. Mathias.

Honorary Secretary's Report 1913-1914.—Gentlemen,—The number of Estates on the Register is now 52 representing a total of 9,905 acres. Seven Estates with a total subscription of Rs.531-1-0 are still in arrears. The revenue for the past year has been from subscriptions Rs.4,910-1-0 and Rs.187-11-0 interest on Fixed Deposit and Current Account with the National Bank of India. Against this there is an expenditure of Rs.6,202-1-8. Owing to certain sums due on account of the Assistant Scientific Officer Fund last year coming into this year's accounts the expenditure seems heavy. A cash balance of Rs.2,915-9-0 was brought forward from last year bringing the total receipts up to Rs.8,013-5-0, thus leaving us at the end of the year with a cash balance in hand of Rs.1,811-3-4 and Rs.4,000 on Fixed Deposit with the National Bank of India.

Benevolent Fund.—Subscriptions this year amount to Rs. 150. There is still a balance of Rs. 110 due by subscribers.

Gentlemen, I beg to submit my resignation of the Honorary Secretaryship.

Roads and Communications.—The following Resolution was proposed by Mr. A. F. Evetts and seconded by Mr. C. C. Kent—"That this Association do represent to the Chief Engineer that owing to the rise in coolies' wages in the District, that the present rates prevailing for work on the Government Roads are inadequate and that unless rates are raised the roads will go from bad to worse, as contractors and sub-contractors are now refusing to continue at present rates."

Green-Bug.—Letter dated 1st August, 1914, from Dr. Coleman, was read. It was decided that the Honorary Secretary do write and thank Dr. Coleman for the information about Fish-oil Soap for spraying purposes. As members now have sufficient stocks on hand to meet any sudden outbreak in North Mysore, it was agreed it was unnecessary to make any further purchases at present.

Co-operative purchase of Manures.—Mr. Bonner on behalf of the Sub-Committee read the following Report: "Your Committee has gone into the subject—to the best of its ability—and has come to the conclusion, that co-operation will undoubtedly lead to a very considerable saving; but the extent of this saving cannot be determined without further correspondence with different firms.

Messrs. Parry & Co. quote rates, that your Committee think might be improved on, and on enquiry of Home firms might lead to further reductions, as regards imported fertilisers.

Nothing definite can, however, be done until it is known definitely, what quantities are actually guaranteed to be taken; when a firm quotation might be asked for from various firms.

It seems necessary for certain chemical fertilisers, that an agent at Home should be in a position to buy such, whenever the market is favourable, and this would necessitate orders being placed considerably ahead,

A small Committee, working in conjunction with the Assistant Scientific Officer, should be appointed to further elucidate the possibilities—but the crux of the matter appears to be, in definite orders, a considerable time ahead.

Some correspondence, with Home and Local Firms (in one instance as regards Basic Slag quotations, from an Indian concern) is in progress; and the results will be communicated when known. It was decided to postpone any further enquiries until the war was over.

Lady Ampthill Nursing Institute.—The meeting was in favour of joining the Institute.

Defaulting Members.—After some discussion the Honorary Secretary was instructed to write to Members paying on the old basis that they be asked to forward their subscriptions which were guaranteed by them for 5 years to the Scientific Officer Fund

Dassara Delegate.—Mr. Danvers will represent this Association at the Representative Assembly to be held at Mysore City on September 30th, 1914.

War Fund.—Resolved: "That the Association should subscribe Rs.500 to H. R. H. The Prince of Wales' National Relief Fund, and that the Honorary Secretary should write to all Members inviting subscriptions."

The sum of Rs.170 was promised in the room.

Election of Office-bearers.—The following gentlemen were elected to serve on the Executive for the year 1914-15.

President	...	Mr. A. F. Evetts.
Vice-President	...	Mr. C. Danvers.
Honorary Secretary	...	Mr. C. C. Kent.
Committee Members	—	Mersrs. A. F. Evetts, C. Danvers, C. C. Kent, W. H. Reed and R. G. Foster.

The Meeting closed with a vote of thanks to the retiring Honorary Secretary.

(Signed) C. C. KENT,
Honorary Secretary.

Mundakayam Planters' Association.

Proceedings of the General Quarterly Meeting held at Mundakayam Travellers' Bungalow on 1st August, 1914. at 10 a. m.

The Minutes of the last Meeting were held as read and confirmed.

Mr. Kirk who kindly agreed at the last Meeting to represent this Association at the Meeting of the United Travancore Planters' Association held at Quilon on the 30th June last, then submitted his report. He stated that only three Associations were represented, *viz.*, the Central Travancore,

South Travancore and Mundakayam Associations and the following office bearers for the new Association were appointed :—

Chairman	...	Mr. J. S. Valentine.
Vice-Chairman	...	Mr. J. A. Richardson.
Hon. Secretary	...	Mr. J. Gwynne.

Some discussion took place regarding the Labour Commission in the course of which Mr. Richardson and Mr. Cook submitted their views and Mr. Kirk informed the Delegates that the majority in this Association did not consider it necessary to join the Commission. Mr. Kirk further reported that the rest of the Meeting was occupied in drawing up Rules for the election of Representatives and that he had committed the Mundakayam Planters' Association to subscribe Rs.25 per annum for nominal expenses.

A plan of the proposed Cattle Pound at Mundakayam was laid on the table and certain donations towards the erection of same were intimated.

The Secretary reported that there was every likelihood of the Government giving about 500 acres for Pasturage land and it was suggested that the Government be asked to fell the same and fence it in and also to build Pettahs for bandies outspanning by the road side as the Police were preventing the bandymen from doing so.

On the motion of the Chairman, it was unanimously resolved "That our Association Rules be amended so as to make it clear that the duly elected Vice-Chairman of the Association is *ex officio* a member of the Committee."

It was reported by the Secretary that the members elected at the last Meeting to form a deputation to Trivandrum had for various reasons, been prevented from going, and after discussion it was agreed to let this matter drop.

The Chairman then submitted his Report as Delegate to the Meeting of the U. P. A. S. I. at Bangalore. He said:—

"Gentlemen,—At the last moment I had to volunteer to act as your Delegate if Mundakayam was to be represented at all. It appears that in future years it would be advisable to elect your Delegate two Meetings before the U. P. A. Meeting, with substitutes, as it is awkward to have to start at short notice. You will all have read the proceedings of the whole meeting in the *Planters' Chronicle*. I did not consider it necessary to speak on any matters except the subjects which concern us.

Labour Commission.—I raised the point as to what would happen to the Working Committee of the new Labour Commission, if an employee of Messrs. Finlay Muir & Co's Firm were elected to the Chairmanship of the U. P. A. This would give them 3 of their own members against 3 elected and nominated members. This issue was met by the withdrawal of Mr. Aylmer Martin's prerogative to be one of the Executive Committee *Item* 12 *U. P. A. S. I. Agenda*. I here called attention to carelessness in sending the *Chronicle* to planters who had left the country or died, and Mr. Abbott backed me in this, in stating that he knew of one gentleman who received, I think, 6 copies. Local Secretaries of all Associations are now asked to send in a revised list of their members, and to give notice when any leave the District and it was also agreed that Firms at home interested in Planting matters, should receive free copies on application.

Scientific Officer Department.—You will have read of the very liberal offer of the Madras Government in this respect, which it seems to me it would be folly to refuse. The Anamalai Planters' Association have been exceedingly kind in their offer of ten acres of land free.

It is urged in this District that the Anamalais is not a suitable place to experiment with Rubber. Against this it must be acknowledged that it is in a very central position for the Scientific Officer's to radiate from, in order to visit local experimental plots of all products. And one certainly appreciates while at the U. P. A. Meeting, that we, in Rubber, are not the only pebble on the beach.

Finance.—The Secretary presented the Budget estimate for the coming year and our funds are Rs.20,941, Expenditure Rs.15,708. This is without including the extra Rs.6,000 required for starting the Anamalai Experimental Station. It was definitely decided that local Associations should not be asked for any further subscription. The necessary funds will be found out of our surplus and by private subscription.

Planters' Benevolent Fund.—I asked here to have it made clear that subscribers to this fund who were not members of any local Planters' Association were entitled to all benefits, as this fund is quite separate from any local party feeling.

Several changes in the U. P. A. Rules were proposed by Mr. Abbott and unanimously carried. I am sure you will all welcome the election of Mr. J. A. Richardson as Chairman.

In conclusion, gentlemen, I am glad to have had the honour of acting as your Delegate and though I derived some benefit from the set speeches made at the formal meetings, I think one derives infinitely more benefit from informal conversations with the Delegates, and private discussion on various topics of planting interest."

A very hearty vote of thanks proposed by Mr. Asher and seconded by Mr. Lord was unanimously accorded to Mr. Kirk, who undertook at the last moment to attend the Meeting as our Delegate.

As proxy for Mr. Hamond, Mr. West submitted the following resolution:—" That in view of the U. P. A. S. I. Labour Commission being now established, and being so very unnecessarily expensive to meet our own needs, that the Secretary of our Association do approach other local Associations, who are similarly placed as to the advisability of establishing a more economical scheme for protecting our interests." In support of same Mr. West stated:—

" Mr. Chairman and Gentlemen,—As his proxy, I have been asked by Mr. Hamond, who much regrets his inability to be present at this Meeting to bring the following Resolution before you:—

" That in view of the U. P. A. S. I. Labour Commission being now established and being so very unnecessarily expensive to meet our own needs, the Secretary of our Association do approach other Associations which are similarly placed, as to the advisability of establishing a more economical scheme for protecting our interests.'

" It will be patent to most that, now that the Labour Commission of the U. P. A. S. I. has been set agoing, it is time that we and other Associations who have not seen fit to support the U. P. A. S. I.

Labour Commission, should take steps to protect our own interests so far as Labour is concerned. The chief reason, I think why this Association and certain others have refrained from supporting the now existing Labour Commission is that of the very heavy subscription which has been asked by those who have thus far piloted that organisation. We are not the only Association which has stood out for that as well as other reasons, and I think their position,—as well as to an extent ours—has been fully dealt with by Mr. Mead in letters from him, which have, from time to time, appeared in the pages of the *Planters' Chronicle*. Mr. Hamond has stated to me that he is in entire agreement with what Mr. Mead has said in these letters. The point of this Resolution, of course, is that all those local Associations which have not joined the existing Labour Commission, should combine and form a Labour Commission of their own. I think I may be right in saying that such a Scheme as is suggested in the Resolutions could be carried through at a rate of subscription which would eliminate all objections to the scheme on the ground of expense, while at the same time giving us advantages similar to those enjoyed by Associations which have supported the larger and more expensive organisation. It has been put to Mr. Hamond that the Travancore Combined Planters' Association, which was recently formed, meets the situation. It does not go far enough; and as far as can be gathered from the report of the Meeting of Delegates appearing in the *Chronicle* of the 18th ultimo, the position taken up by the Meeting was a passive one, not a constructive one, on the question of the Labour Commission and there, apparently, the matter ends so far as this new Association is concerned. The object of this Resolution which I wish to emphasise is that the course proposed is a constructive one, and the formation of such a Labour Commission, as I have referred to need not, in any way, interfere with the proceedings of the new Travancore Combined Planters' Association. What is proposed is a Labour Commission, not another Combined Planters' Association. There is no question, as has been suggested to Mr. Hamond by the Chairman of this Association, that the object of this Resolution is to form another Association for Mundakayam District alone, as the Combined Association, necessary to carry out the formation of a Labour Commission, is already in existence and it will be for the local Associations to say (if they are agreeable to the formation of a separate Labour Commission) whether the new Combined Association will deal with the matter. You are, however, now only asked to support, in the first instance, an effort to obtain the views of other Associations on the question of the formation of a Labour Commission separate from that of the U. P. A. S. I., and I think that this at least might be done meantime."

The Resolution was seconded by Mr. Simmons as proxy for Mr. J. R. Vincent and after discussion was carried by a majority.

The following Resolution was submitted by the Secretary as proxy for Mr. Howson:—

"That this Association strongly condemns the idea of approaching any members of the native staff employed on any Estate in the District without the knowledge and sanction of their employers, with a view to inducing them to leave their present situations by holding out offers of higher pay, and that the Association considers that apart from the discourtesy of the proceeding, an unhealthy competition is created, which cannot be but harmful to the District." Mr. Milbank then put Mr. Howson's views on the question before the Meeting and urged that members' support should be given to the Resolution. It was carried by a majority.

Mr. Harley reported what has been done with regard to the removal of the Post Office from its present site.

The Secretary then submitted his correspondence to the Meeting.

It was arranged that the next Meeting of the Association be held at the Mundakayam Club on 7th November, 1914.

The proceedings terminated with a vote of thanks to the Chairman.

(Signed) H. B. KIRK,
Chairman.

MUNDAKAYAM PLANTERS' ASSOCIATION.

A Special Meeting of the Committee of the above Association was held at Peruvanthanam Bungalow on 21st August, 1914, to meet the District Magistrate, Mr. S. C. H. Robinson with a view to taking steps to prevent any undue or artificial raising of prices of foodstuffs by Mundakayam bazaarmen and traders in consequence of the War. Mr. Robinson explained what he had done in other places in his jurisdiction and indicated generally how he intended to deal with local tradesmen and how the Association would be enabled to check the prices of foodstuffs charged by them. Mr. Robinson also kindly agreed to arrange that the Treasury Officer at Peermade would cash Currency Notes and also cheques from Members of this Association on being informed of the probable amount of cash being required from that source.

A hearty vote of thanks was unanimously passed to Mr. Robinson for the advice and assistance that he gave to the Association.

VALLARD (Dr.) Pour lutter contre les Mouches. (To combat flies) :—

La Vie Agric. et Rur., Paris, ii, no. 14, 17th March, 1914, pp. 373-378, 3 figs.

The author records the following species of flies as associated with the transmission of disease ; the common house-fly, *Musca domestica*, the small house-fly, *Homalomyia canicularis*, the blue-bottle fly, *Calliphora vomitoria*, a green and gold fly, *Lucilia caesar*, and the stable flies, *Stomoxys calcitrans* and *Muscina stabulans* ; the two latter being rare in dwelling houses. In view of their disease-bearing potentialities, flies should be prevented access to dwelling houses wherever possible. Various methods are given for destroying flies once they have entered the house, such as traps containing soap solution, sticky papers, pyrethrum powder either as a fumigant, slowly burned, or as a powder, or formol mixed with milk. Bouet and Roubaud recommend fumigating with " cresyl," the fumes of which act instantaneously on flies and mosquitos, but are not harmful to metal work, leather, etc., and beyond causing slight irritation to the eyes, are harmless to human beings. Manure and rubbish heaps, etc., in which the flies breed, should be as far away as possible and treated with larvicides such as chloride of lime, a 20 per cent. solution of slaked lime, petrol and sulphate of iron, a solution of borax and arsenate of soda, or crude oil mixed with water.

No very efficient natural enemies are known. They are preyed on by species of *Bembex*, and the fungus *Empusa muscae* is very pathogenic to them, but has not yet been successfully cultivated artificially.—*The Review of Applied Entomology.*

TEA.

Indian Tea.

Mincing Lane Market.

There were no public auctions this week owing to the Easter holidays. Privately there were good enquiries, and it is anticipated that a strong tone will again prevail when the auctions recommence next week.

Will Demand Exceed Supply?

Fear is expressed in some quarters that the trade may possibly be faced with a famine. Looking forward, to our probable total supplies, it is interesting to note how rapidly the world's consumption is increasing. This increase greatly exceeds the increase of supply. We are, therefore, inevitably in face of a famine, sooner or later, but the new consuming countries are, as yet, somewhat coy, and might easily be frightened of our tea. In France and many other countries afternoon tea has become fashionable, and those in the vogue willingly pay up to 4s. a pound for tea, but the fashion may change, and tea will not be wanted; nor probably, will its disappearance be much regretted.

Policy on Restriction Changed.

Importers arranged, some months ago, to regulate their sales until the whole of the past season's crop was sold, and a number of them had decided to spread out their weekly offerings so as to continue up to the end of May. It is now stated in the market, however, that the remainder of the tea unsold will be printed as rapidly as possible, and that the former arrangement is being abandoned. The high prices, and the recent strength of the market, has led to the belief that no harm from the seller's point of view will be done by speeding up the rate of sale, while there is also a desire to close up accounts on the part of companies; to issue their annual reports, and distribute the good dividends which have been earned. In some quarters this change of policy is regretted, but in view of the fact that there cannot be a great deal of tea left to send to market, it is thought that no particular harm will result for the sellers.

Prospects of Forthcoming Season.

Now that there is very little of the past season's Indian tea left to pass through the auctions, attention is being turned to the possibilities of the forthcoming season and to the question of whether or not increased supplies are likely to be forthcoming from India and other countries of production. The producer of British-grown tea would doubtless be satisfied if the forthcoming season proves as good as the one now practically closed notwithstanding that in Ceylon and some districts of Northern India, the weather last year was not all that could be desired. At the same time, however, it is not to be doubted that an effort will be made in all tea-growing countries to increase the outturn as much and as quickly as possible, because the high prices with which the past Indian tea-selling season here is closing particularly for common grades, are a great incentive to growers. Already indeed there are signs of increased outturn. From the beginning of January to the end of March, Ceylon shipped 25,015,486 lbs., as against 22,550,769 lbs., last year, to the United Kingdom an increase of 2,464,717 lbs., and the estimate for April is, approximately, some 11½ to 12 million lbs., about the same as for the corresponding month last year. In Java also the outturn is increasing, and as the production of the Island later on will compare with the period of drought last year, when production was restricted, a substantial increase is being looked for on the 12 months.

Sumatra Tea.

The produce from this country is a contingency to be looked forward to in the near future. To what extent the production of tea in Sumatra will effect the supplies this year cannot be gauged, but it is unlikely that the outturn of the new produce will be other than comparatively small for the present. At the same time considerable interest is being taken in the fact that the first consignment from that country has been received and sold at satisfactory prices. Distributors hail the advent of Sumatra as a tea producer with great satisfaction and hope that the Island will afford some relief from the pressure to which they have been subjected, if not this year at a not very distant date. Considerable publicity has been given to the fact that Sumatra has now commenced production and the *Financial Times* has had an interesting article on the subject. This journal says that it has been at some pains to gather up opinions of the experts in the market upon the quality and make of the tea offered and it reports that they are all quite favourable. The leaf is well made, with some show of tip even in the lower grades, and as to the liquor there seems to be general agreement that for a first effort of a new plantation it is quite a success. There was none of the "greenish" flavour observable in it which is so often noticed in new Indian teas. When the first efforts of the Java tea planters were put upon the London market the infusion was far from being satisfactory. Most of the teas had been so over-fired as to taste smoky and objectionable; so much so, that at one time it was a by-word of reproach to style any sort of hopelessly undesirable tea "Javary." It is also quite within the memory of the older habitues of Mincing Lane that the early teas of Ceylon were what the market called "knobbly"; light in the hand and lumpy, not at all wiry or twisted, and as for the liquors of those "knobbly" lots, they certainly coloured the water, but were far from being attractive to drink. Sumatra, however, starts off with every advantage. Assam seed, expert management, modern methods, up-to-date factories fitted with the latest appliances,—and the result is pronounced as excellent. One point, however, which must not be overlooked as regards Sumatra and one which may possibly lead to the hopes of distributors of considerable extra supplies from that quarter being modified, is the question of labour. So far the tea estates in Sumatra have been planted out with Javanese labour. Java, itself, however, is now experiencing some difficulty in obtaining sufficient labour and there is an agitation to prevent encroachments by Sumatra.

Probable Increase in Supplies.

It is, of course, early yet to forecast with any confidence how matters will stand by the end of the year, because of the great uncertainty of the industry, and the many influences which experience has shown may intervene, upset calculations which had apparently been formed on a very solid basis. At present, however, the general opinion is that this year will see a considerable increase in the supplies, and particularly those available for London. India is expected to do its utmost to turn out larger crops, notwithstanding the dangers attaching to coarse plucking; while China, which, as a result of unfavourable weather, and the bad results obtained in the previous 12 months, supplied a considerably smaller quantity last year, is likely to make an effort to obtain an advantage from the prices which have been ruling of late. At the same time, notwithstanding the opinion that larger supplies will be received there are to be found some authorities here who doubt whether the extra quantity deemed likely to be available will cause any material fall in prices. Their argument is that consumption is expanding so rapidly that it will offset the increase in supplies. This is

perhaps taking a very sanguine view, particularly as the high prices have recently been reflected in a falling off in the Exports from London, and may continue to cause a contraction in the foreign demand for tea. The majority in the trade, however, would welcome some decline in prices particularly those for common tea, because it would make for a healthier position in the trade generally, and give the distributors, who form a very important branch of the industry, an opportunity to make a profit. It would only require concerted action on the part of some of the large distributors to raise their prices to the public to bring about a halt in the expansion of consumption of tea in this country, and possibly, a reduction, because so far the public has not felt the effect of the high prices, the burden having been borne by the distributors.

Green Tea.

A curious feature, in connection with the trade, is the attraction that green tea has for large numbers of people. The green colour of the leaf, except in the case of Indian or Ceylon green teas, must necessarily be a foreign matter; it cannot add to the flavour, or make the tea cup more welcome, and yet China green tea is in constant use in every country, where tea is drunk at all. Another kind of tea, Formosa Oolong, has, it is said, its own particular attribute, but no foreign matter is introduced. The peculiar character is given to the leaf, it is stated, owing to its growing in close proximity to the great camphor forests of Formosa. But I am not in a position to vouch for the correctness of the statement.

Patent Tea Chests.

There has been considerable discussion of late in tea trade circles on the subject of the increased use of such patent tea chests as the "Venesta" and "Acme." The *Financial Times* points that one result has been to increase the difficulty of gauging the quantity of unsold tea left on hand. The good old days when Assam abounded in teak forests, which enterprising planters were able to cut down and saw up for tea chests, have gone for ever and the rough clumsy package has been replaced by a much lighter and stronger chest made of patent "Venesta" wood, which consists of three thicknesses of hard-wood veneer cemented together, two of which are placed lengthwise, and the third crosswise. The result is a waterproof package of amazing strength. The old teak chest frequently weighed between 40 and 50 lbs, without any tea in it, while the Venesta chest is under 20 lbs.

Planters have been steadily adopting the new chests for years past, and it has been found possible to increase the quantity of tea in them without making them inconveniently heavy to handle. So many charges in connection with the tea trade are reckoned on a basis of so much a chest that there is a certain advantage in increasing the weight of tea in a chest as long as the gross weight is still considerably less than it used to be; and it cannot matter much, to a public career, for instance, whether he has to carry 120 lbs. of tea or 125 lbs. in a chest as long as he charges on the gross weight. There are, however, several charges at the bonded warehouses, based on the old idea so much per chest, which are in no wise increased by an extra 5 lbs. in the chest, and it is therefore quite imaginable that the net weights of the chests are being increased from time to time as the empty package is made of lighter material.

This tends as will be seen, to disturb the statistics of Mincing Lane operators very seriously and now, as the season draws to its close and everybody would like to know how much has yet to be marketed before 1st July, it is beginning to be deemed probable that a larger weight of tea has passed

the hammer than a mere enumeration of so many hundred packages sold would work out at. The packages, it is said, have been heavier and contained more tea than they used to do, and from careful inquiry it is very doubtful if to-day, with the increased import shown by the Board of Trade figures there is as much undisposed of as there was at this date a year ago. The London Tea Brokers' Association, with the concurrence of the importers, has pursued a wise policy all through the season in limiting the supplies each week to moderate proportions, and the effect has been the steady market. Of course there has been a steadily increasing demand to help them, and there has also been in the minds of importers a sort of certainty that nothing would be lost by more or less restraint. Prices were all the while tempting but no symptoms of collapse were ever visible, however, ardently looked for by buyers, and while the profits to the distributors have been diminished, the season now looks as if it would have a peaceful end.—*Indian Planters' Gazette.*

The Yucatan Sisal Output.

The carefully worked out suggestion made by Mr. Alfred Chatterton, C. I. E., Director of Industries, State of Mysore, that "there is probably a million acres of unoccupied land in this Province more or less suitable for aloe or sisal cultivation" causes one to look up statistics regarding the outputs from Mexico and to consider what chance such a large area as the one mentioned would have if brought into direct competition with that old-established industry of the Indian and half-Indian population of Yucatan; and industry too, that is run on lines that, even if it is not actual slavery, could never be allowed in Mysore. According to the *Boletin de Estadistica*, the official organ of the *Hacendados Henequeneros*, of Yucatan, last year was a record one as regards the total exports of sisal, which were:—

	Bales.	Tons (1,000 kos.)
Jan. 1st.—Dec. 31st, 1913	836,950	... 145,280
,, ,, 1912	814,610	... 139,902
,, ,, 1911	680,990	... 116,547
,, ,, 1910	558,996	... 94,789
,, ,, 1909	567,427	... 95,756

Of this output 520, 143 bales were exported during the second half of 1913, against 491,841 bales in 1912. As the total weight of the 1913 shipment was 90,658,183 kos., the average weight was 175 kos. or about 350 lb. Of the 520,000, one firm, that of Avelino Montes, exported 406,728 bales (71,466,000 kos.), Arturo Pierce coming in as a poor second with 86,741 bales (14,609.887 kos.), and the Cia de Hac. Henequeneros was third with 18,817 bales (=3,244,867 kos.). The average value of the sisal shipped during the last six months of 1913 was 28·145 cts. (100 cts. =1$=2s.) per kilo., against 20·882 cts. in 1912, so that the price was 7·263 cts. better per kilo. (2·204 lb.) The value of the 520,000 bales (July-December shipments) was $25,516,500, equal to £2,516,000

Were India, therefore, to plant up even 100,000 acres with sisal, and that area gave a fair yield, it would be interesting to see how far the Indian output could affect the Yucatan planters, and how the combined outputs would affect prices. We fear they would be pulled down below the limit of profit-yielding, as many centres to-day dabble in the sisal and some have a fair output, but no one outside Yucatan seems to be growing rich out of the industry, and many seem extremely loth to have anything to do with the fibre.—*Tropical Life.*

RUBBER.

Para.

The prosperity, indeed, at the present time, the existence of the trade of Amazon depends upon the rubber crop and the prices obtained in Europe and America for the product of these States. By these prices, however much they may fall, would still be remunerative to the Brazilian *seringueiro* if he could reduce the expense of (1) collection; (2) transport; (3) taxation and other charges so as to bring the cost below the selling price. To do the first is not impossible, and it is to some extent being done. The principal article of the gatherers' food is farina, and this is now being produced locally at a price which has considerably reduced the cost of rubber at Pará.

As I stated in my last report this cost has never been exactly calculated. Indeed, it has been practically impossible to reckon it, as much of the expense consisted of barter into the value of which so many varying considerations entered that no standard could be fixed. It is now generally thought that by successively lowering the cost of farina, dried meat, fish, &c., and producing other items of food on the spot the cost of collecting the wild rubber can be brought down, perhaps even so low as 2*s*. per kilo. in Pará.

A good deal can be done, too, towards raising the value of the rubber by rigorously excluding impurities and improving the quality. But there still remain the questions of freights and export duties.

Food-stuffs.—As regards the cultivation of food-stuffs there can be no doubt that the Amazon districts could well supply the needs of an enormous population,

In the present circumstances, however, there are many difficulties in the way of farming on a large scale. The margins of rivers, where only settlers are now to be found, are liable to periodical floods. On the subsidence of the water and for just such a distance as is reached by the inundation, food-stuffs can be planted which yield a heavy return. The irregularity of the floods, however, make regular farming precarious, and the soil beyond the reach of the waters is soon exhausted. Consequently, the settlers can raise little more than suffices for their own immediate needs.

On the other hand, in the interior of the State exist high lands with, in some places, wide savannahs where cattle and horses could be raised and cultivation carried on to almost any extent.

I am informed that the geological information and the flora of these districts form a continuation of the southern parts of Brazil and, making a curve round the eastern part of the State of Pará, link on to the Guianas in one continuous whole. The lands about the estuary of the Amazon are principally alluvial, and the flora, while mostly of similar genera, in nearly every case differs in species. If these districts could be peopled with an industrious class of immigrants there is no doubt that a very valuable source of riches could be cultivated there.

Colonisation.—Political conditions and the insecurity of tenure and other causes make schemes of colonisation hazardous. A good class of colonists could be brought from the States of Ceara and Maranham, where such poverty exists, and whence most of the labouring men, rubber workers, etc., in the Amazon now come. Their experiences, however, have hitherto been discouraging.

A letter appeared in the "Estado do Para" of May 1, 1914, giving the story of two families that came from Rio Grande do Norte and settled at

Sao Luiz do Igarape-assu, on the Braganca Railway. They numbered 25 persons, of whom only 10 were not grown men. They were all experienced agriculturists, and were prepared to live hard and to work hard. "On their arrival here they took possession of some of the immense tracts which exist in their centre, and when they were about to begin their labours a land surveyor appeared and, by superior orders, dispossessed them, on the plea that these same lands had been granted to public officials." As there were 12 more men of the party waiting to join them from their homes, they looked for other lands, and found that "besides immense ceded territories, there exist also innumerable concessions granted two, five and ten years ago, still without improvements, except a *tapiry* or straw hut" and yet they were closed to settlement. The consequence was that this private attempt, which ought to have been encouraged by all means, proved a failure, and. what is worse, he had report spread to those parts whence the most desirable immigrants can be drawn.

The citation of this case is the best reply I can make to the inquiries I receive at this office as to colonisation in North Brazil.

And it is yet unquestionable that other products must be found to eke out the living that is now dependent on rubber.

Other Products.—Oil yielding fruits, such as the cocoanut. the *Pupunah*, an oil palm (*Guilielma speciosa*, Wallace) which appears to be nearly identical with that of West Africa, and some 20 other nuts, all giving as much as 75 per cent. of excellent oil, could be produced here in almost limitless quantities. Wood for crushing into pulp, all kinds of valuable timber, rosewood (such as furnishes the scented essence that is such a valuable product in French Guiana), dye-barks, and various medicinal oils, are also abundant and could easily be shipped in any quantity desired and yield a handsome profit if capital could be sure of fair treatment in Brazil.

At this time, when the rubber and the coffee industries are languishing, it is practically a matter of life and death, politically speaking, to do everything possible to encourage and foster other industries.

Cotton, cocoa and cattle, which already exist, ought to be developed by every means and might become very rich sources of wealth in all parts of Brazil.

But it would be very unwise to invest capital here without really effectual guarantees.

Conclusion.—In conclusion, I may say that the general impression is that the crisis in the affairs of the Amazon will be overcome, and that things are already beginning to improve. It is believed that the people will adapt themselves to the new conditions, and that the Pará rubber will survive and provide a good living for the country.

It is pointed out that few peoples could have established a successful industry such as the Amazon rubber has been, under almost overwhelming disadvantages amidst which this has been done. In the depths of the nearly impenetrable bush, in pestilential swamps where the mortality has been frightful, in extreme poverty and solitude, meagerly supplied with the barest necessaries of life, and brought at enormous cost from vast distances and through difficulties that might have appalled less brave men, the Brazilian rubber gatherers have brought out and sent to Europe and to North America scores of thousands of tons of rubber and secured to their country as much as £7,000,000 and £8,000,000 in a single year.—*Diplomatic and Consular Reports, Brazil.*

The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

It will be seen that after an absence of some six months the Planting Expert has resumed his articles in this paper. These papers, we have been informed, have been much missed, and their resumption will doubtless add very much to the interest of the *Chronicle*.

We publish the proceedings of a general meeting of the Wynaad Planters' Association.

The Tropical Agriculturist, from which we make the extract, published an article on the use of Fertilisers, which is well worth the careful study of planters. No dogmatic laws can be laid down for their use, as every locality, either on account of climate or soil, varies so much, and it is for this reason the aid of science is so useful and necessary to prevent waste, and to point the way in which a fertiliser can be best used. But the author of this article lays down the necessity and value of continual experiment. In the United States a single observation may be sufficient for a hundred surrounding miles. "In the Philippines there is an astounding local diversity of soil." All should be guided by Science in the shape of an Agricultural Chemist.

The effects of non-manuring in Brazil are shown in the first para of the article on Coffee extracted from *Tropical Life*. Here again is laid down the law by Sr. Paulo de Moraes in his last sentence: "There is no fear of the production of Coffee failing to keep up with consumption with this new reserve to fall back on and the *introduction of more scientific methods of cultivation in the old.* The italics are ours.

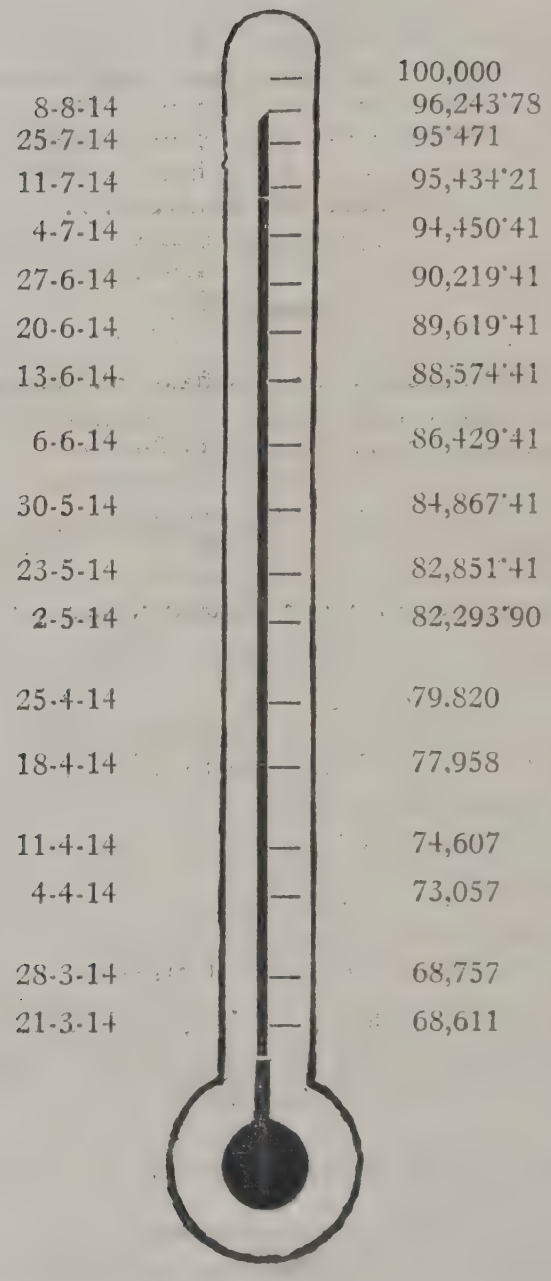
Though Mr. Ernest Green, late Government Entomologist of Ceylon, in his paper on the Animal Pests of Hevea, says he can only speak for those which occur in Ceylon plantations, it will be found that many of them are common to Southern India. The whole paper is very interesting, and the wiliness of the porcupine and the bandicoot is brought into prominence.

A short note by Mr. A. B. Hall on the Duration of the Action of Manures is extracted from the *Journal of the Board of Agriculture*.

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

I reached Colombo on my return from home leave on 28th September, and resumed my duties at Bangalore on 1st October. It will take some little time for me to pick up the threads of my work and discover what has and what has not been done in the Agricultural World of S. India, but I shall endeavour to do this as rapidly as possible, and I shall be glad to renew my usual correspondence with planters.

Probably one of the immediate effects of the European War may be to force planters to economise on their estimated estate expenditure, and manurial programmes are no doubt in danger of being cut down. In view of this possibility I would call attention to the great value of green manuring. Such a manurial system, while it may be slower in its effects, is of lasting value and cheaper to carry out than the more usual systems. There is a large choice of plants to choose from in South India, Crotalarias and Tephrosias probably being the best. During the past five years I have written much on this subject in the *Chronicle* and I would now call special attention to an article which appeared in April in the *Agricultural Journal of India* written by Mr. Cland Bald and reproduced in the *Chronicle* on p.342 of the present issue, apparently from some other source.

Pollination of Coffee by Bees.

Mr. Bainbrigge-Fletcher, the Imperial Entomologist, has issued a Report on the work carried out during the past Coffee season in Coorg, Mysore, and the Shevaroys, and this appears as Government Order No. 2268. I understand that the Agricultural Department of the Government of Madras will shortly issue the Report in the form of a Bulletin when no doubt planters will be able to get it. The report is a very full one and of great interest to Coffee planters. The general conclusions come to are as follows:

(1) The presence of bees is not essential for the successful pollination of coffee, but

(2) The natural, and therefore most desirable, form of pollination is achieved by the aid of flower-visiting insects, of which

(3) Bees are the most important.

(4) Of these bees, the only one which need be considered is the large rock bee (*Apis dorsata*).

(5) There is fairly definite evidence that the numbers of this bee have suffered a steady reduction in the coffee districts of late years, and that

(6) Such diminution is due to (*a*) the reduction of suitable nesting-places owing to the opening up of the coffee districts and (*b*) to the systematic persecution of the colonies of bees in certain districts for the sake of honey and wax.

(7) It is not practicable to take the honey without destroying the bees, but

(8) It is possible to collect the wax without injury to the bees after the latter have deserted their combs which they do at regular times of the year.

(9) In districts in which destruction of these bees occurs on any considerable scale, it were well that the Forest Department be requested to refuse the issue of rights to collect honey and wax in forest areas except under special restrictions as regards the number of nests to be taken, or the time of year at which they may be taken.

(10) Planters should regard bees as useful allies and do all possible to protect and encourage them within the limits of their own estates.

(11) In any experiments in bee-keeping, the Indian bee (*Apis indica*) is likely to prove the most suitable. (It may be added that the Agricultural Department will always be willing to assist would-be bee-keepers with advice and help as far as possible.)

Agricultural News in the Mail.

The India Rubber Journal of 12th September contains an interesting leading article dealing with the situation of the Rubber Trade at home from which it appears that there is great activity in many branches and a great effort is being made to absorb German trade. Naturally Continental orders are all in abeyance but there is a phenomenal rush of Government work. Every Rubber firm has been asked to quote for ground sheets and Scottish houses have received more orders than they can cope with and work is proceeding day and night. All the regular houses that cater for Government contracts are full up and the small and even large houses who do not usually go in for Government work are now being asked from different sources for quotations and more huge orders are expected to be placed shortly. Ground sheet business alone will keep the best part of the firms in the rubber trade going for the next eight to ten weeks at the least.

The Jaconet trade for bandages, ambulance purposes and surgical purposes has also been and is still very great. The Government has also come into the market for macintosh capes and garments which is excellent news for the garment makers and could not have come at a better time because the ordinary business has disappeared for the moment. All the cloth houses are having a very good time and it is chiefly Lancashire which is securing the orders.

The large manufacturers of electrical fittings are full of work a large proportion of which is directly traceable to the diversion of business formerly sent to Germany. One large German Firm has held a very commanding position in regard to the ebonite and fibre business and British firms have all benefited from the disappearance from the field of this German rival.

Nature of 10th September, reports that great developments have taken place recently in the utilisation of Nitrogen from the atmosphere for the manufacture of fertilisers and other Nitrogen products. The Odda works in Norway are now producing 85,000 tons of Calcium carbide and 80,000 tons of Calcium cyanamide (Nitrolim) a year and this output will soon be increased.

The use of Nitrolim as a fertiliser is increasing rapidly. It is frequently recommended to use Superphosphate in general fertiliser mixtures containing Nitrolim but this would appear to be a wrong policy. Experiments reported in the monthly *Bulletin of Agricultural Intelligence* indicate that it is *not* advisable to mix Cyanamide and Superphosphate. Although the Nitrogen of the former is not affected there is as a result of the mixing a reduction in the amount of water soluble phosphoric acid of the latter fertiliser. The Phosphoric Acid necessary in such mixtures is better supplied by Basic Slag and a mixture of Nitrolim, Basic Slag, and Sulphate of Potash has given some good results with Coffee in Coorg during the past two years.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Wynaad Planters' Association.

Proceedings of a General Meeting held at the Meppadi Club, on September 9th, 1914.

PRESENT.—Messrs. Bownass, Macbain, Mackay, Macleod, Malcolm, Milton, Parker, Powell, Vernede and C. E. Abbott, (Honorary Secretary.)

MR. BOWNASS in the Chair.

1919. *Proceedings of last Meeting* were confirmed.

1920. *P. W. D. Bungalows.*—With reference to para 1913. Applications from the public to use these must be made annually.

1921. *Revenue Re-settlement of Wynaad.*—The Honorary Secretary stated that nothing further had been heard about this.

1922. *Special Meeting of U. P. A. S. I, in Madras.*—The Minutes of this Meeting have been circulated to all Members.

1923. *District Board Railways.*—Read letter from Mr. Winterbotham stating that the question of levying a cess for the construction of light railways in Malabar was to be discussed at the Board Meeting, and enquiring if the Association would support a proposal to construct railways from Calicut and Tellicherry to the foot of the Tambracherry and Peria Ghauts. Read Honorary Secretary's reply that, as Mechanical Transport for passengers was likely to be established between Calicut and Wynaad by private enterprise long before the railway would be built, he did not think there was much use in taxing ourselves for the purpose. Dr. Milton, the representative of the Association on the District Board informed the Meeting that the only question before the Board was that of acquiring an interest in the Palghat, Pollachi, Dindigul railway, and that the Executive Engineer West Coast Division considered that if it were built, this line ought to be a broad gauge one. As Mr. Winterbotham was not present the matter then dropped.

1924. *Freights*—Read Indian Tea Association circular dated August 19th, 1914, in which Members are recommended to pay the increased freight under protest. Read letter from Mr. Nicolls. Read the Honorary Secretary's letter to the I. T. A. enquiring what further action, if any, it was proposed to take as this increase appears to stultify the action of Government in indemnifying shipowners against War Risks so as to prevent any stoppage of trade with England. A reply has been received from the Secretary I. T. A. explaining that the recommendation referred to was made with regard to an agreement not terminable before the end of September 1917, entered into by the steamship owners and the several firms and partnerships concerned; but that as no such agreement appears to exist in Southern India the Committee of the I. T. A. feel that shippers there must pay whatever charges the respective lines may levy, though they consider that we should be well advised if we acted on the suggestion made by the Chairman of the Nilgiri Association, Mr. Nicolls, and represented the matter to the Imperial Government pointing out, at the same time, the effect of the increase as explained in the Honorary Secretary's letter quoted above. *Resolved* that this Meeting is prepared to join the Nilgiri Association in moving the U. P. A. S. I. to address the Imperial Government through the proper channel.

1925. *Veterinary Assistant.*—Read letter from Honorary Secretary with reference to Agricultural Leaflet No. 3, and reply from Mr. Cammiade stating that the Veterinary Assistant tours in Wynaad from time to time, and that Planters requiring his services should apply to the Tahsildar.

1926. *Madras Planters' Labour Law.*—Read letter from Honorary Secretary to Mr. Cammiade asking him to support our request that the Madras Government should recognise the attestation of village Patels in Mysore, as these are the only officials that our Maistries can get in touch with.

1927. *Scientific Officer's Department.*—Read U. P. A. S. I. circular 14 stating that the Coorg Planters' Association is prepared to subscribe its share to the funds required for the Government of Madras to take over the Department provided that other Associations also subscribe in the same proportion. It was resolved to postpone the consideration of this subject till the next Meeting in order to receive further information.

1927. *Prince of Wales Fund for the Relief of Sufferers by the War.* A circular was sent round to Planters in the District (see para 1918). The Honorary Secretary stated that a cheque for £36 had been sent to Messrs. H. S. King & Co., London to be handed to the Treasurer. A list of subscribers has been placed in the Meppadi and Vayitri Clubs.

Papers on the table—

Mr. Justice Sadasiva Iyer's Ruling on the Madras Planters' Labour Law (this is circulated with the Proceedings).

G. O. Nilgiri Parks and Gardens.

G. O. Madras Planters' Labour Law.

G. O. Malaria in Wynaad.

A vote of thanks to the chair terminated the Proceedings.

(Signed) W. EVERETT BOWNASS,
Chairman.
(,,) C. E. ABBOTT,
Honorary Secretary.

STRAITS SETTLEMENTS.

Rubber Exports during July, 1914.—The following figures of the exports of cultivated rubber from the Straits Settlements during the month of July, 1914, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for July, 1913, being added for purposes of comparison :—

	1913.	1914.
	Tons.	Tons.
July	1,120	1,584
January—July	5,933	10,090

These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra and the Non-Federated Malay States, but do not include rubber exports from the Federated Malay States.—*The Board of Trade Journal.*

SOILS AND MANURES.

The use of Fertilisers.

A recent issue of the *Philippine Agriculturist and Forester* contains a valuable contribution on this subject by " E. B. C." whose initials will be readily recognised as those of a writer whose opinion on such matters is entitled to respect.

The title of his article is " Caution in the use of Fertilisers " which is not adopted here as it is likely at first sight to mislead some people into thinking that the writer is inclined to discredit the manuring of the coconut palm to which he particularly refers, or that the use of fertilisers is fraught with danger.

In reality what he desires to impress on the planter is the need for a rational system of manuring based upon experience and a full consideration of local conditions, so as to secure the best results at the smallest cost. The article, which is reproduced in its entirety, is well worth the careful study of the planters.

The use of fertilisers is often regarded as the most essential and characteristic feature of the practice of scientific agriculture. Courses of agricultural instruction usually give much more attention to this than to any other part of the subject. There are various books and good books, devoted to the subject of fertilisers and their use. Every general treatment of one of our crops devotes much attention to this phase of its proper culture. In one book on the coconut, there are nearly 150 pages devoted to fertilisers. The planter is continually urged to use them, and the favourable experience of those who have done so is constantly invoked for his guidance.

There is no question as to the general possibility of securing by means of fertilisers greater yields than will be obtained without them. There is likewise no question as to the profits which can usually be obtained by the judicious use of fertilisers. Neither is there any doubt that such manures as are produced on the farm can be used to good purpose as fertilisers, and that failure so to use them is always very wasteful.

Nevertheless, the dogmatic treatment which the subject often receives in editorials and appeals to the farmer, and in many others places, is thoroughly misleading. There are two general reasons why this is so. In the first place, the evidence is not what it seems to be. It is the almost universal custom outside of well conducted experiment stations to apply fertilisers to the land, to observe the increase in production of crops, and to construe this as measuring the profit. It needs no consideration to show that increased yield and increased profit are by no means the same thing. Before a profit from the use of fertilisers can be computed the farmer must, of course, take into account the cost of fertiliser, and the cost of operations incidental to its use, such as for instance harrowing it into the ground. In careful work there must still be considered interest on the money tied up, the future value of fertilisers still remaining in the soil, and the value, independently of fertilisation, of treatment given incidentally to the use of the fertiliser. It is rare indeed to find a farmer who keeps his books in such a way that he knows at all accurately what the application of fertilisers has cost him. Even the manure of his own stock is rarely applied without some expense, whether for fencing, herding, hauling, or otherwise.

There is no kind of experimentation which requires more perfect understanding of the subject and knowledge of possible sources of error, and care in guarding against unreliable results, than does the testing of the value of fertilisers. In such experiments, when carried on

as field or plot cultures, the soil takes the place of the chemist's laboratory apparatus, and the soil is complex far beyond anything in the chemist's laboratory. The gross chemical composition of the soil is easily determined and is reasonably stable. But the individual constituents as chemical compounds fluctuate from day to day. These fluctuations are partly understood and are partly under control.

It is generally believed by those who are not professionally acquainted with the subject, that it is possible to determine by chemical analysis of the soil what fertilisers, and how much of each, can profitably be applied to it. This is sometimes the case, but it is a rare one. Soil analysis may reveal such scarcity of nitrogen, or potash, or phosphorus that one may safely conclude without any other evidence, that one of these substances will produce such results as are sure to be profitable. Much more commonly this is not the case. The soil analysis is likely to indicate what experimental tests are most likely to be worth while, and these experimental tests will then be a guide to the use of fertilisers on the farm.

There are many reasons why the analysis alone is not a safe guide for the application of fertilisers. It has already been mentioned that the elements in the soil are constantly re-arranging themselves. What is present in the soil is of value to the farmer only as his crops take it up and use it. The crops take all of their food from the soil in solution in water. Any compound in the soil is available when it is dissolved and unavailable when it is not dissolved. The extent to which the food materials in the soil enter into solution depends obviously on the amount of water present. In the soil of most farms and of the best coconut plantations there is moving water which brings into the soil about the trees food material from other places. However poor chemical analysis may show such soil to be, the trees are well nourished, and the use of fertilisers is very likely to be unprofitable. The application of fertilisers, guided by chemical analysis, but without taking into account the water supply of the soil, is, therefore, irrational.

Crops differ considerably in the demands which they make upon the soils. Some of them have deep root systems, and can accordingly take up food at depths down even as far as two meters. Others have the roots very close to the surface; for those, deep-seated stores of food are available only as the substances come toward the surface of the soil, in solution. Some plants are conspicuous for the quantity of single food element which they require. These peculiarities of individual plants are always taken into account in applying fertilisers to crops of temperate lands. In the tropics it is customary to attempt this; but as a matter of fact our knowledge of the requirements of most of the staple tropical crops is altogether inadquate in this respect. We have no such analyses, that is, no such large nnmber of analyses, of cocount trees, or their leaves, or nuts, or of the abaca plant or fibre, that any man can say with confidence that either of these plants needs to take up any particular amount of any particular per cent. of any single mineral food. It is sometimes possible by analysis of the plant, or the marketable product of the plants of various temperate crops, to ascertain that some mineral food is not present in normal amount, and, therefore, to decide that this food could be profitably applied as a fertiliser. The knowledge obtained by analysis of the plant is, in such cases a very much safer guide to the use of fertilisers than is the suggestion afforded by chemical analysis of the soil.

The second objection to the evidence at hand demanding the use of fertilisers on our crops is the fact that there is not taken sufficient account

of the extreme variability of local conditions. The world's study of fertilisers has been made in Europe and the United States. In the central United States observations made in one spot are usually valid ten miles away, often one hundred miles away, or even more. The soils and climate have been so perfectly studied that the intelligent farms can easily know whether or nor the results obtained at his state experiment station are immediately applicable to his own farm. In the Philippines there is an astounding local diversity of soil. At this College it is difficult to secure a square tract of one hectar on which soil conditions are so uniform that one part furnishes a valid check for all others. The variable climatic factor is water. Its variations are not so intensely local as those of the soil except as the water varies with the difference in the soil. Still there are places in the Philippines where at sea level the rainfall at points 20 Kilometers apart varies in the ratio of fully 3 to 1.

Under such conditions the individual planter should take experience in other places as a guide to practise on a large scale.

With all of this, I do not intend to discourage the use of fertilisers, Their proper use would be one of the greatest possible improvements in the agriculture of most parts of these islands. There are provinces in which the staple industry will be improved by their judicious use more than in any other one way. There are probably few farmers in the whole Archipelago who could not increase their profits if they know how to use fertilisers to the best advantage. But while they do not know what fertilisers are most needed, what forms can best be secured, when and how they should be applied, and what results can reasonably be expected from their use, the time for their widespread application has not arrived. Their use on a large scale, with confident expectation of profit, would merely result in the majority of cases in disappointment, and in the establishment of prejudices, which would be very difficult to remove, against their further employment.

In securing the adoption of any improvement in agriculture, haste must be made slowly. This is true when those who give advice are sure of their ground, When experimentation itself has not passed the earlier stages, it is not time to make haste at all. The time is always here to encourage the farmer to experiment. When he does this understanding that he is making experiments, and that it is not in the nature of an experiment that the results should be made known in advance. He can be told with confidence that it is possible for him to use fertilisers with profit. He can also be told how to find out how to do this. In many places, it is now possible for the Government, through field representatives of its bureaus, to help the farmer plan his experiment, so that it will be most likely to show how to use fertilisers profitably.

The most rapid possible advance in the use of fertilisers in these lands will be by enrolling the farmers as experimenters, by helping them to institute and properly control their experiments, and by taking care that they understand that failure with one fertiliser and in one place is no more reason for discouragement than success with another fertiliser and in another place is a reason for the general adoption of locally successful methods.

Finally, it must be understood that many experiments prove nothing whatever, and that this is especially true of experiments made by those who are not especially expert in such work. So long ago that every individual concerned has now left the Philippines, I saw an experiment made on the fertilisation of the coconut by means of ashes. These ashes were applied

to two parallel rows of trees runing east and west. During the suceeding few months the trees of the south row which had received the ashes, exceeded the other row remarkably in production. This fact was duly reported as a most instructive demonstration of the value of ashes as coconut fertilisers.

The fact was that the trees of the south row were an average of 3 or 4 meters higher than those of the north row, and that they were at all times correspondingly thriftier. The experiment included the winter months when the south row shaded the north one to a considerable extent. But if the experiment had been properly started, the trees of the two rows exactly alike and equally exposed to all outside conditions except the fertilisers, it would still have been true that the application of the fertilisers could have had no appreciable effect on the production during the time the experiment lasted.

There have been reported to me the results of two other experiments on the fertilisation of coconut in these islands. In both cases, the supposed improvement was observed before it possibly could have been due to the fertilisers applied. In all of these cases the treatment was probably beneficial, so that good happened to result from the accident ; but the observed results were none the less accidental.

Men are not so quick to tell about their mistakes as about their successes and it is probable that at various times fertilisers have been applied, and decided to be valueless or injurious ; and that the subsequent thrifty growth and production, for which the fertilisers were really responsible,—have been construed as evidence of recovery,

The first essential in any scientific agriculture is the understanding of the ways of the plant.—*The Tropical Agriculturist.*

Rubber Statistics.

The following are the statistics of the rubber industry for the whole of Malaya, only estates of 100 acres and over being included : —

	1912.	1913.
Acreage in possession ...	1,055	1,151
Estates	1,498,282	1,622,231
Acreage planted	621,621	708,545
Rubber alone	587,874	682,613
Rubber interplanted with catch crops	33,748	25,932
Acreage producing	165,566	213,459
Planted during year... ...	85,903	86,924
Output (in tons)	18,956'8	28,169'16

The area under rubber in acres in the various portions of the Peninsula is as follows :—

	1912.	1913.
Federated Malay States ...	399,197	433,324
Straits Settlements ...	94,263	111,316
Johore	91,827	117,022
Kelantan and Kedah ...	34,837	45,373
Trengganu	1,497	1,510
Total...	621,621	708,545

The Federated Malay States, with an output ot 21'229'17 tons, rank first in importance, the output of the Straits Settlements amounting to 6,047'14 tons, Johore 1,645'7 tons and Kelantan and Kedah 246'18 tons, Trengganu is not yet a producer.—(*The India-Rubber Journal.*)

COFFEE.

The Non-manuring of Coffee in Brazil.

"In the Ribeirao Preto neighbourhood in Brazil," Mr. Wileman tells us in *M. A. C.* ("Mainly About Coffee,") "the crop this year is not only normal but the outlook is good; but this is exclusively so only on the plantations that have been well treated, which probably do not exceed 75 per cent. of the total. Yielding to the demands of their "colonos," most planters have had to consent this year to the interplantation of corn between the rows of coffee trees, with but very little manuring with chemical fertilizers." This, of couse, is a short-sighted policy, as, given the right formula, both maize and coffee, even when planted apart, well repay an application of plant foods, but to grow both crops together and then to grudge the application of fertilisers is only to court trouble. "As for manuring with husks no plantation yields enough during the course of a year to manure even one-fifth of the trees growing on it." On the other hand, "the quantity of phosphates imported into the Ribeirao Preto district last year was 1,100 tons, of which 700 tons were taken by one planter, leaving only 400 tons for the other 700,000 trees in the district." To show how badly the trees need mauuring it is reckoned that out of 53,000,000 trees some 6,000,000 were poorly cared for, whilst another 6,000,000 are considered to be so neglected and stinted as to be nearly dead, and so unable to affect the output. Truly this is a case of being "penny wise and pound foolish."

This is a lesson that wants to be borne in mind by many planters outside the Ribeirao Preto zone with its 53,000,000 trees, for whilst the world finds that Sao Paulo puts out ample supplies of coffee, this is probably due to the new areas that are constantly being brought into bearing rather than to the old ones being cultivated and manured to keep them up to the mark, although there is no reason why they should be allowed to become exhausted through lack of having those plant foods put back that the crops remove and the ever-growing trees demand for themselves. Think of how much a bag of Sao Paulo weighs, and how many bags she turns out in a crop. We all know that Brazil, as a whole, has produced some 19,000,000 bags in twelve months, the bulk from Sao Paulo; realise, therefore, how many hundreds and even thousands of tons of potash, phosphates, nitrogen, &c., were exported for ever from Brazil in such a crop. How much, we wonder, was replaced; probably less than the bags themselves weighed that contained the coffee. If, therefore, the older established estates do not wish to be left out of the running and become "scrapped," they must manure, and do so judiciously and adequately, having careful regard to the needs of plants and of the cost. Discussing the new coffee area now being opened up to Salto Grande, Mr. Wileman tells us:—

"The opening of Sorocabana railway extension to Salto Grand, on the Paranapanema, has been the signal for an outburst of enthusiasm at Sao Paulo. The branch just opened to traffic starts from Botucutu, on the main Sorocabana line, and at present ends at Salto Grande, on the Paranapanema; thence, swerving to to the north, it is being extended to Porto Tybirica, on the river Parana.

"The triangle composed between this stretch of the Parana and the valleys of the rivers Teite and Paranapanema, with its apex at Botucutu, comprises some 20,000 square miles of the best land yet available for coffee planting in South America and, in fact, the only really great reserve that the coffee industry has to count on for extension of consumption.

" Besides the Teite, this area is watered by the rivers Aguapehy, Peixe, Feio, and Anastacio, which flow into the Parana. The soil is fertile and only to the south of the Paranapanema is it peculiarly liable to frost.

" Referring to the district between the rivers Feio and Paranapanema, Sr. Paulo de Moraes, the present Secretary of Agriculture, on the occasion of the opening of the Sorocabana branch to Salto Grande, described how, only five years ago, this vast region, now *the hope** of Sao Paulo, lay derelict and idle, the happy hunting ground of the few tribes of nomadic Indians that still exist on Sao Paulo territory,

" Only four years ago all that civilization had to show at Salto Grande was a few huts and one considerable coffee fazenda on the Parana side of the falls. To-day the township of Salto Grande counts 250 brick houses, whilst fresh villages have sprung up at every station along Bauru extensions is already beginning to make its impression on crops, and accounts to some extent for the expansion of the current crop, for which due allowance has not been made.

" Until lately," Sr. Paulo de Moraes reminds us, " the Mogyana district had been regarded as the centre of coffee production in Sao Paulo. This centre, he believes, will before long be dislocated and the new area between the Teite and Paranapanema, with its hundreds of thousands of acres of virgin soil suited for grazing, coffee and cereals, become the centre of production in Sao Paulo. The importance of this extension of the Sorocabana can scarcely be over-estimated or the part it is destined to play in the maintenance of the supremacy of Sao Paulo as a producer of coffee. There is no fear of the production of coffee failing to keep up with consumption with this new reserve to fall back on and the introduction of more scientific methods of cultivation in the old." But the said scientific methods must include adequate manuring.—*Tropical Life.*

Rubber in Jamaica.

In the Report of the Superintendent of Field Experiments for 1913-14 of the Department of Agriculture, Jamaica, the prospects of the Rubber Industry are depicted in somewhat gloomy terms. We are told that " the financial aspect of Castilloa Rubber as an investment in Jamaica is by no means encouraging..... We grow few crops in Jamaica at present with so meagre financial return as that indicated to be obtainable from Castilloa Rubber..... Pará Rubber trees, eight years old after systematic tapping, refused to give a free flow of latex..... this confirms the the view that Hevea braxiliensis is not suitable for commericial cultivation even in the most favourable parts of Jamaica."

The experience of Jamaica seems to be akin that of Trinidad and Tobago, so far.—*Proceedings of the Agricultural Society of Trinidad and Tobago.*

Treating Latex in London.

The *Financial Times* of London States that a concern, known as the Robinson Securities Syndicate, Ltd., proposes to bring latex direct from the forest trees to the London manufactory, to be scientifically treated, so as to secure an evenness of grade. It is said that the transport of the latex to London in its natural state is a revelation, while the rubber already produced from such latex is reported to be of excellent quality.—*India Rubber World.*

* Note these words.—Why should they be applied to Sao Paulo, with its immense output of coffee in the past; do they not denote exhaustion in the older established estates?

RUBBER.

Animal Pests of Hevea.

Mr. F. Ernest Green, late Government Entomologist of Ceylon, read the following paper on "Some Animal Pests of the Hevea Rubber Tree" at the International Congress of Tropical Agriculture. He said he could only speak of those pests which occur in Ceylon plantations. Trees newly introduced into a country are generally free from insect pests unless those pests are brought with the trees. In the case of the Hevea the copious flow of latex if the bark is wounded, protects the tree to some extent from insects. But this comparative immunity does not extend to the foliage; and in the case of larger animals the latex appears to be the object sought for. It might be thought that a substance which when coagulated becomes rubber could not be drunk by any animal with impunity, but it appears that the latex has no injurious effects either upon the lower animals or upon man himself.

Elephants, goats, pigs, porcupines, rats are among the animals which Mr. Green mentioned as attacking the rubber tree. The porcupine, he said revels in its sappy bark. A single animal may completely strip the stem of a three or four years old tree from the ground level up to the height of two feet. If the stripping is all around the tree, of course the tree will die; if only a small area on one side is attacked, the tree may struggle on, but it is best to remove it out of the way. The porcupine is one of the wiliest of animals and most difficult to destroy. He will not enter even the most cunningly laid of traps, and he has a keen scent for poisoned bait. The native villager uses a spring gun and has more success than any one else. The planter may watch night after night waiting his chance to shoot the porcupine, without the animal ever putting in an appearance; and then a native may set a spring gun and succeed in killing it.

The bandicoot, a huge rat with powerful saw-like teeth, is a pest that will cut through a tree several inches in circumference. Certain species of slugs were first brought to Mr. Green's notice in 1905, as imbibing the latex from recently tapped Hevea trees. He said that quite conceivably many pounds of rubber are lost in this manner. In Java, and Sumatra also, species of slugs have been found drinking the latex. The best way of dealing with those of Ceylon is to surround the tree with a protective barrier of some strong smelling substance, *e.g.*, sawdust saturated with crude carbolic acid may be laid around the base of the tree.

Naturally, every insect that lights on a rubber tree is looked upon by the planter with suspicion, and small as is the list of pests it would be smaller still if all the merely casual visitors that are included in it were eliminated. Most of the enemies of Hevea are secondary pests that do not attack healthy trees, but the fact of their being secondary pests does not decrease their importance. They may complete the destruction of a diseased tree, when otherwise it would recover.

Certain species of grasshoppers attack the tree. White ants call for some attention, but they are not very serious in Ceylon, Nor is the notorious *Termes gestroi* a pest there. Certain large beetles lay their eggs on the ground near the trees, and the newly hatched larvae burrow down and attack the roots. The best protector from these is nitrate of soda. A species of longicorn, not a native of Ceylon and only recently introduced, has become a serious pest.

Boring beetles have attracted more attraction than any other pest. They are found in the stems of dead trees, but it does not follow that they have

killed them. In fact, it is doubtful if these small beetles can penetrate the bark of a healthy rubber tree, although the fact that latex is sometimes found to be exuding and flowing down the stem is taken by some planters as proof that these insects will attack healthy trees. But there are other causes of bleeding. For example dead bark may separate from the wood, leaving a cavity surrounded by healthy tissue. If the dead bark forms a cortex over this cavity and is pierced by the borers the latex will flow down the tree,

With such a large area under cultivation it may seem astonishing that the list of pests is so small, and the increased attention being given to the matter makes it more difficult for them to obtain a foot-hold. But large, unbroken areas of a single cultivation always give conditions favourable for the establishment of a pest ; and it is sound policy to break up such an area by interplanting with other trees. By this means any disease-stricken area may be confined within practicable limits.

In discussion, Mr. Whitby said he was much inclined to agree with Mr. Green that one of the functions of the latex is to act as a protective agent against the attacks of insects. In this connection he would draw attention to a fact which is not generally appreciated, *viz.*, that the latex obtained from the tree after wound response has set in is of a different quality from that which flows on first tapping the tree. The latter coagulates almost immediately, but after wound response has set in the latex may remain liquid for some hours. Protection of the tree is not the prime function of the latex, but it is one of its functions. He had heard of an interesting instance of this some time ago. The manager of the Tandjong Estate, which is largely under tobacco, found that tobacco pests swarm over the rubber trees, but as soon as they pierce the bark the latex exudes and coagulates, and consequently the pests have no influence. The fact that latex can be drunk without injury seemed to suggest to Mr. Whitby that caoutchouc is not present in it as such, but there is some other substance out of which the caoutchouc is formed.—*India Rubber Journal.*

Duration of the Action of Manures.

A. D. Hall.

The facts already brought to light by the experiments upon the Little Hoos Field at Rothamsted may be summed up as follows :—As regards farmyard manure, the nitrogenous compounds introduced by the consumption of cakes and other concentrated feeding stuffs have to be distinguished from the compounds derived from the straw and the undigested residues of such coarse foods as hay. The former will have an immediate effect on the first crop, and to a much smaller extent on the second crop, after which they disappear. The latter compounds act slowly, do not waste, and have a measurable value for many years, though for practical purposes their action after the fourth year may be neglected.

Phosphatic fertilisers, even when soluble like superphosphate, do not waste in the soil, and there residues continue to be effective until they have been exhausted by the corps.

In view of the fact that the wastage in the residues of active nitrogenous fertilisers takes place during the winter, it would be of great advantage, especially on rich soils, to grow a catch crop before the winter and so convert these nitrates, etc., into insoluble plant material to be afterwards ploughed in to become available for another crop.— Journal of the Board of Agriculture,

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 42.] OCTOBER 17, 1914. [PRICE As. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department condenses into three pages some very interesting facts from the Indian Tea Association General Committee's detailed report.

The Rubber Grower's Association issued a circular on the supply of acetic acid, which in itself contains a very important message to South Indian Rubber Planters. At this time when freights are high and charges on account of war risks make every article expensive, this circular is peculiarly interesting and instructive.

Mr. Tunstall's address to the Darjeeling Planters' Association shou'd be read carefully, not only for the suggestion given but as being eminently practical.

We only hope that the good news extracted from the *India Rubber Journal* will continue and that the South India Rubber Planters will be able to ship their produce and take advantage of the prices mentioned.

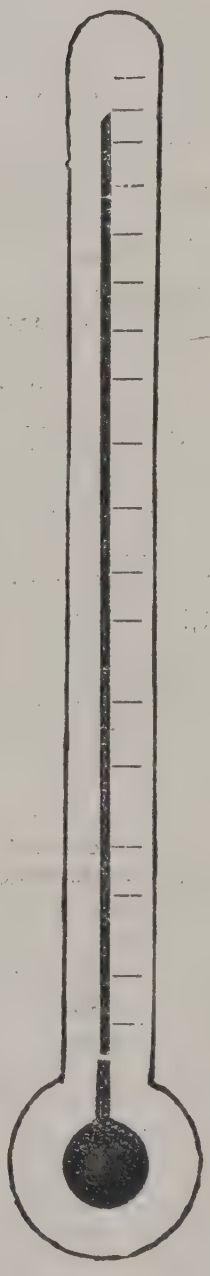
IMPERIAL INDIAN RELIEF FUND.

	Rs.
Previously acknowledged	225
Mr. J. G. H. Crawford	100
Mr. J. G. Hamilton	50
Capt. Foster	50
Mr. M. J. Woodbridge	50
Mr. D. Jackson	50
Mr. F. M. Hamilton	50
Mr. S. Sladden	50
Mr. V. Hunt	50
Mr. H. M. Northey	50
Mr. E. W. Rutherford	50
Mr. C. Lake	50
Mr. W. Scholfield	50
Mr. R. A. Anderson	50
Mr. T. Anderson	50
Mr. H. F. Anderson	25
Mr. L. Hill	25
Total Rs.	1,025

BAROMETER

OF

Labour Department.



	100,000
8-8-14	96,243'78
25-7-14	95'471
11-7-14	95,434'21
4-7-14	94,450'41
27-6-14	90,219'41
20-6-14	89,619'41
13-6-14	88,574'41
6-6-14	86,429'41
30-5-14	84,867'41
23-5-14	82,851'41
2-5-14	82,293'90
25-4-14	79.820
18-4-14	77,958
11-4-14	74,607
4-4-14	73,057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

The Indian Tea Association.

The detailed report of the General Committee of the Indian Tea Association for 1913, is as usual full of interesting information. The Association's new Experimental Station at Tocklai in Assam is now complete. A sum of Rs.62,887 has been spent on the Scientific Department during the year of which Rs,31,000 is contributed by the Government of India, Bengal, and Assam, and the balance is derived from the revenues of the Association. The total planted area represented by the Association is 411,783 acres and the subscription rate is two annas per acre.

The Association is now faced with the large question of whether the Scientific Department should direct its energies to research work or to advisory work. The two properly go hand in hand and it is impossible for the Department to devote itself entirely to practical advice without carrying on any research work. But if more advisory work is to be carried on in future than has been done, steps will have to be taken materially to increase the staff.

"Several alternative courses are possible. The Department may be either advisory or research, or it may combine advisory with research work, that is to say it may be decided that the Department exists primarily for the purpose of giving advice on manurial and other questions to individual estates, involving personal visits from the officers qualified to advise on such questions; or it may be laid down that research work is the principal object of the Department. Indeed, while research work can be carried on without any advisory work being done, in which case the officers would make only such visits to gardens as might seem to them necessary in connection with the problems being studied at the time, it would not be practicable to confine the work of the officers to personal advice, for it will be recognised that the time would soon come when research work would be necessary in order that such advice should be of real value. It is obvious that a combination of the two alternative courses, advisory and research work, is the most satisfactory course to adopt. The difficulty is that the staff of the Department on its present basis is too limited to allow of as much advisory work being done as is wanted."

No apology is made for quoting the Report of the General Committee at such length for the U. P. A. S. I. are faced with much the same question with regard to their own Scientific Department though on a much smaller scale, and if the generous offer of the Madras Government is accepted the Council will be forced to make up their minds what policy they will adopt for the future work of their Scientific Department with its limited staff. It is of interest to note what Dr. Hope, the Chief Scientific Officer of the Indian Tea Association, thinks about the matter. Speaking at the Annual Meeting in March 1914, he said:—"It is a matter of regret to the officers of the Department that complaints have frequently been received from the Tea districts to the effect that they do not tour sufficiently. Nobody I think appreciates more the value of touring as a means both of educating ourselves and enabling us to get into touch with planters than do the officers of the Department, but as you know, the geography of the tea districts and the conditions of travel in them make it very difficult to get from place to place quickly and this handicaps the work of touring considerably." * * *

"I would ask you to remember that the ultimate value of the Department to the industry must depend upon research work and for this reason research should always occupy the foremost position in the programme of a Department such as ours."

All of which is to be heartily endorsed and it applies very closely to the Planting Expert and the Assistant Scientific Officers in South India. The former since his appointment five years ago has been kept almost constantly on tour and has been allowed practically no time for research work, while it is often complained that the latter does not tour enough to suit many planters. As far as the Planting Expert is concerned he feels that he has exhausted the advisory side of his work and for the Scientific Department of the U. P. A. S. I. the time has arrived when research work is necessary in order that further advice may be of any real value.

Dr. Hope has recently paid a visit to Java, Sumatra, and Ceylon in connection with the tea growing industries in those countries and he makes the following pertinent remarks on the subject of manuring :—

"Wherever agriculture assumes an intensive form, manuring plays a great part, and I am firmly convinced that manuring is going to become a factor of very great importance in the treatment of the tea gardens in North East India. It will therefore be in greater measure than hitherto, a care of the Scientific Department to encourage the use of manures and to advise in this matter so that the best results may be obtained for money expended. This work has already become considerable, and I am pleased to be able to say that highly successful results have followed from many of the recommendations which have been made. As an example of this I would remind you that more than a couple of years ago we announced that good results were to be expected in many cases from the application to tea soils of lime in one or other form. The extent of the recent increase in the total consumption of lime for manurial purposes on tea estates since we brought this matter to notice, is in itself an indication of the value of the recommendation."

"I regret that another matter to which notice has been drawn repeatedly, both in the publications of the Department, and by the officers when they have been on tour,—the great necessity of growing green crops in order to obtain and improve the tilth of the soil—has received comparatively little attention."

In some of the tea districts of Southern India manures are now being systematically used, with the result that a marked improvement in yield and quality of the tea is being obtained, but this unfortunately does not apply to all of them, while green manuring is neglected in all the tea districts. The 'clean weeder,' who cannot, or will not, make any distinction between weeds and a green dressing reigns supreme in all the tea districts. Nevertheless this cheap and valuable system of manuring should receive more serious attention and if only a few estates would give green manuring a careful and systematic trial, especially in conjunction with artificial fertilisers, they would soon realise the benefit to be gained from it.

The Production of Tea in India.

The following statistics published in the report of the I. T. A. may prove useful for reference purposes :—

Area of tea under cultivation in India in 1912.

Assam	361,671	acres.
Bengal	150,497	,,
North India	19,394	,,
South India	58,556	,,
Burmah	1,715	,,
	591,833	,,

THE PRODUCTION OF MANUFACTURED TEA PER ACRE DURING 1912.

Darrang	...639 lbs.	Sibsagar	...545 lbs.	Darjeeling	...322 lbs.
Sylhet	...606 „	Malabar	...500 „	Kangra	...207 „
Lakhimpur	...604 „	Dehra Dun	...478 „	Chittagong Hills	...182 „
Travancore	...595 „	Nilgiris	...456 „	Almora	...136 „
Jalpaiguri	...591 „	Goalpara	...407 „	Ranchi	...125 „
Cachar	...559 „	Kamrup	...341 „	Garhwal	... 55 „
Nowgong	...556 „	Chittagong	...352 „	Hazaribagh	.. 31 „

THE EXPORTS OF INDIAN TEA BY SEA AND LAND IN 1912-13.

To United Kingdom	198,457,842 lbs.
To Europe	34,315,152 „
To Africa	2,578,886 „
To America	13,782,662 „
To Asia	20,070,101 „
To Australia, New Zealand, and Fiji ...	9,396,855 „
Total by Sea	278;601,489 „
Total by land	3,213,840 „
Grand Total	281,815,329 „

Of this 19,368,510 lbs. were re exported from the United Kingdom to foreign countries.

8,888,638 lbs. of green and black tea were imported into India during 1912-13, of which 3,221,332 lbs. were re-exported, leaving a balance of 5,667,306 lbs. while the production during 1912-13 was 295,953,583 lbs. and the exports 276,148,023 lbs. leaving a balance of 19,805,560 lbs. for consumption in India, an increase of 4,511,088 lbs. since 1911-12.

The number of persons employed in the tea industry in 1912 is returned at 547,545 permanently employed and 95,590 temporarily employed. These figures are incomplete because in Southern India some of the work is done by contract in which case no record of the labour employed is available.

According to the returns of the Registrars of India Joint Stock Companies and accounts of the companies registered in the United Kingdom as reported by the Indian Tea Association the capital of Joint Stock Companies engaged in the production of tea amounts to Rs.26·4 crores, or over £17·5 millions : *viz* :—

Companies registered in India	...	Rs. 3,79,13,836.
„ „ in United Kingdom £15,122,192	...	„ 22,68,32,880.

RUDOLPH. D. ANSTEAD,
Planting Expert.

ACETIC ACID.

The supply of Acetic Acid for Coagulation and Alternative Coagulants.

The Rubber Growers' Association on 25th August, issued the following Circular :—

"In response to your enquiries we have carefully considered the question of the supply of acetic acid for coagulation purposes, or its substitution by some other coagulant, owing to the shortage in supplies.

"The raw material for the production of acetic said, namely calcium acetate is a bye-product in the manufacture of charcoal for the production of steel and the bulk of the supplies are derived from the North American Continent. This is shipped and converted to glacial acetic acid chiefly in Holland, Belgium, Germany, Austria, and Scandinavia. There are only two manufacturers in this country and we believe only one of these, the United Alkali Company, makes the strongest acid. The other English manufacturer in Messrs. Asworth, of Bury, Lancashire. At the present time we understand these manufacturers are besieged with orders and cannot at the moment undertake to supply any acid, although they may be in a better position later on.

"The most likely foreign sources are the Dutch firm at Schiedam (Agents, Messrs. Grieff) and some American firms who supply through J. B. Wilkinson of Dudley Hill, Bradford. It is questionable whether much of the acid now obtainable is pure enough for use in coagulation of rubber latex. A fraction of one per cent. of copper renders the acid not only unsuitable, but positively dangerous. Very minute quantities cause the rubber to soften and go tacky. A quantity of copper amounting to '01 per cent. introduced into the rubber through the use of contaminated acid for coagulation is sufficient to convert the rubber to a semi-liquid, sticky mass. Consequently all supplies should be examined before shipment.

"Acid showing a blue or greenish shade should be rejected and when there is any doubt the acid should be submitted to analysis.

"The copper is derived from the copper stills used in making the acid and contamination is very likely to arise after a stoppage, or breakdown, in the apparatus. Probably most of the Continental plant has been shut down owing to the war. When this plant is started up again there will be very little acid not contaminated with copper and special precautions must be taken by Plantation Companies to stipulate that the acid is free from copper, or to have it analysed before shipment.

"It therefore appears that with the shortage of acid there is also a possibility of impure and unsuitable acid being sold. Acid containing copper and other impurities will be offered in the place of the purer forms of acid previously in use and not now obtainable.

"English manufacturers would be prepared to put down a plant for making the acid if they were assured a steady demand at a reasonable price. There appears to have been a considerable over-production in Europe during recent months before the war broke out, and we believe Germany shipped large quantities although their home demand is usually sufficient to absorb the bulk of their supplies. As a result the manufacture in this country was not remunerative.

"It has been suggested that acetic acid might be replaced by other coagulants. Of these the various organic acids such as formic, lactic,

oxalic, tartaric, etc., occur as likely substitutes. Unfortunately all these acids are of foreign make and have all increased in price. Some of them are unsuitable for particular reasons, the third mentioned is poisonous. Some of them are solid and not easy to dissolve. The first two are liquid and suitable for coagulating latex. Samples of rubber prepared with them gave satisfactory results on testing. Lactic acid is, we believe, entirely of foreign make and is more expensive than acetic acid, apart from any rise in price. Formic acid alone remains as a practical substitute.

"Unfortunately the rise in price and difficulty in obtaining acetic acid apply equally to formic acid. Yet in cases where it may be found impossible, to obtain delivery of acetic and formic acid is available, the latter can safely be substituted. Formic acid is more effective, weight for weight than acetic acid. Probably about two-thirds the quantity will be required for coagulation. The same danger as regards contamination with copper applies as with acetic acid and the acid should be submitted to analysis before shipment.

"In the event of failure to obtain urgent supplies of suitable acetic, formic, or even lactic acids, there are two alternatives. (1) The latex can be allowed to coagulate spontaneously or with the help of smoke. (2) A mineral acid can be used.

"As to spontaneous or natural coagulation, the quality of the rubber is satisfactory. The disadvantage is the time taken, often two or three days for ten or twenty gallons of latex in bulk. Even then a certain amount of latex escapes uncoagulated. A further disadvantage is the horrible stench in the factory resulting from the incipient putrefaction of large volumes of latex.

"These difficulties can, to some extent, be obviated by allowing the latex to coagulate naturally in trays in the smoke house,

"The use of a mineral acid for coagulation of latex should not, in our opinion, be lightly condemned as a risky and dangerous procedure. We have prepared numerous samples of rubber by coagulation with mineral acids. Some of these samples are now several years old and appear in as good a condition as similar samples of acetic acid coagulated rubber. The same applies to vulcanised rubbers. If we were offered the alternative of an impure acetic or formic acid containing traces of copper and a pure mineral acid such as sulphuric acid, we should not hesitate to choose the latter. The effect of traces of copper on rubber is deadly, the effect of sulphuric acid in the right proportion we believe to be harmless.

"Of the various mineral acids, sulphuric acid is the most suitable, as also the cheapest. It has the disadvantage that when mixed with water much heat is evolved and the operation of diluting the acid is dangerous if not performed in the right manner. The acid can be exported in iron drums of 2—5 cwt. capacity. For our purposes small vessels would be more suitable although this would add to the freight. It could be sent out in two-gallon jars, or even in half-gallon stoppered bottles. The jars or bottles must be packed in wooden cases filled in with whiting to mop up any acid in case of leakage.

"Some difficulty might be found in getting shipping firms to carry sulphuric acid to the East, Increased freight charges could be borne as the sulphuric acid is both cheaper and more effective as a coagulant than acetic acid, that is to say a smaller proportion would be required.

"In the place of acetic acid 'acid salts' could be used, such as bisulphate of soda and sulphate of soda or alum. The latter is much used for coagulation purposes by native holders, The former would be more effective and more easily dissolved in water. It could be packed in wooden casks and would be equivalent to about 40 per cent. of free sulphuric acid.

"We cannot say, at the moment, exactly what quantities would be required for coagulation, probably about the same proportion as acetic acid.

"Calcium chloride has been suggested, but this is a very uncertain coagulant. It is a salt of a mineral acid and is open to the same objections as alum or salts of sulphuric acid.

"If desired, we shall be glad to arrange for trial lots of bisulphate of soda or other coagulants for sending to the East."

The Acting Government Chemist, Peradeniya, Ceylon, on 21st September, published the following information on the subject:—

"Owing to numerous enquiries which have been addressed to the Department of Agriculture with regard to the possible local production of a crude acetic acid suitable for the coagulation of Hevea latex, it has been decided to issue forwith a preliminary statement in order that the position may be more clearly understood by those interested. On ascertaining that there would probably be a shortage of acetic acid and other imported coagulants, the Department began to investigate the possible coagulants which could be obtained locally, working on the assumption that the extreme emergency for which we should be prepared would be an almost total stoppage of suitable imported coagulants. In putting forward proposals for steps to be taken in the case of the emergency it is not inferred that other and more suitable coagulants may not eventually be imported to meet the case. But we cannot depend on such an event at the present. It was obvious that a supply of crude acid could be obtained as in Europe by the Distillation of Woody and other Vegetable Matter.

"If wood is used it is left for some considerable time to dry, hard woods are more suitable than soft. The best material to use from the point of view of compactness and dryness seemed to be cocount shell, and this has yielded very satisfactory results.

"The process consists in distilling without water, a quantity of dry coconut shells is a closed retort--the condenser tube taking the form of a metal coil immersed in a barrel of running water. No part of the apparatus should be of copper as there would be a danger of traces of this metal finding their way into the acid possibly giving rise to tackiness in the rubber. The retort may take the form of a cast or rolled iron pipe of suitable dimensions or else of some form of "boiler" shaped retort. The size will of course vary according to the quantity of acid required.

"On the whole a horizontal retort is the most suitable as it will permit of the raking out of charcoal at one end and recharging with fresh material. Such a horizontal retort will have an air-tight plate clamped over each end, one being removable in order to charge and clear out the interior of the retort.

"An exhaust tube for the vapour would lead out of the top of one end of the retort to the condenser. The vertical form of retort would have a cover and exit tube as in the previous case. The cover would have to be movable

in order to charge and clean the retort. This process would not be so easy as in the case of the horizontal retort. The retort is supported by a brick framework which also contains the fire which heats the retort.

"Yields can be given only with the greatest caution as they will depend on the efficiency of the apparatus used. At Peradeniya, the apparatus consists of a small coal retort practically a narrow iron pipe with clamped plates at the ends. It takes a charge of 4 lb. broken coconut shells at a time. On charging the retort with broken coconut shells and lighting the fire under it, fumes containing permanent inflammable gas will emerge from the end of the condenser tube; subsequently a tarry liquid will begin to collect in the vessel placed at the end of the condenser tube. The retort must not be heated too strongly—not to red heat, for instance—but just sufficiently strongly to decompose the material and convert it to charcoal. When liquid ceases to appear at the end of the condenser it is time to recharge the retort.

"The liquid collected is allowed to settle in a closed vessel for some days. It will then be found to have separated into tar, most of which will have collected at the bottom, and a dark brown watery liquid the crude or pyroligneous acid.

"This is syphoned off and filtered through some material such as blotting paper to remove globules of tar. It is then ready for use. A dilute solution is first prepared by adding to every part of the crude acid, nine parts of water. Of this dilute acid use about 16 oxs, to every gallon of latex. It may be possible to use less than this quantity on some estates; the minimum quantity should be used.

"This will hardly be suitable for the purposes of making pale crepe though by the addition of sodium bisulphite a moderately pale crepe has been obtaind.

"This crude acid is, however, most suitable for use on estates where smoked sheet is made. These yields are only given provisionally as being obtained with the small plant at Peradeniya on small quantities of material, they should, however, afford usful indications of the yields which could be obtained on a larger scale.

"From 10 lb. dry coconut shell there were obtained about ½ lb. tar and 2½—3 lb. crude pyroligneous acid (containing about 12 per cent, acetic acid).

"This after separating from tar and filtering is made up for use by adding 1 vol. to 9 of water and adding 16 ozs. of the mixture to every gallon of latex.

"The crude pyroligneous acid cannot be completely decoloured permanently by any simple means. Part of the tar is steam-volatile and the distillate would gradually darken again on keeping.

"By keeping the acid in contact with charcoal for some time and redistilling some improvement might be attained.

"It has been mentioned above that it has been found possible to obtain a fairly pale rubber by this crude acid with the help of sodium bisulphite, but in view of difficulties arising in this connection, or of the supply of bisulphite failing, and also in order to ascertain whether other local products would serve do coagulate latex, investigations have been made with toddy-vinegar. This is a crude form of acetic acid, of which it

contains 3-5 per cent. Latex has been successfully coagulated with it and yielded a pale rubber.

"One sample was satisfactorily coagulated, the proportion used being 3 ozs. toddy-vinegar to 1 gallon latex (3 lb. dry rubber per gallon). This coagulation was lengthy and took several hours. When 4 oz. per gallon of latex were used coagulation was complete in two hours.

"The rubbers obtained were quite pale and when combined with the use of sodium bisulphite this process yielded a very pale rubber indeed.

"It is important that this toddy-vinegar should be bought under guarantee that it contains no copper. Otherwise it would have to be re-distilled. Assuming that an unadulterated toddy-vinegar is bought at Re.1 per gallon and 4 oz. are necessary to coagulate one gallon normal latex then 1 lb. dry rubber would necessitate the expenditure of 0·83 cents in toddy-vinegar.

"This is undoubtedly high as compared with Acetic Acid. The Department is, however, merely indicating a local source of supply of acid which could be used in an emergency.

"The production of crude acid from coconut shells should cost very much less than 0·8 cents. per lb. rubber. There appear to be no figures enabling one to estimate the total amount of toddy-vinegar now produced in the island.

"The above facts are given in order that the public may understand that local sources of acetic acid exist and may be utilised. Other possible sources of acetic acid are being investigated. It is not suggested that they are by any means ideal or that their use may not have objections.

"One of the great advantages of glacial acetic acid has been that it has assisted largely in standardisation—the strength being known. The strength of wood distillates, &c., will be liable to variation as will also be those of toddy and other vinegars."

With reference to the statement in the Rubber Growers' Association Circular that acid salts might be used, Messrs. T. Stanes & Co., Coimbatore, write that they are in a position to supply Bisulphate of Soda on very favourable terms. They have kindly offered to send the Planting Expert a large sample for experimental purposes. As Mr. Anstead is unable to experiment at Bangalore, owing to the difficulty of obtaining latex, he has approached the Planters' Associations in the Rubber growing districts on the subject and hopes that some one will volunteer to carry out experiments.

The points to be investigated are:—

(*a*) Whether Bisulphate of Soda is a suitable coagulant for Hevea latex.

(*b*) What strength of solution should be used.

(*c*) What the cost will be per pound of rubber.

It would certainly appear better to use some substitute for Acetic Acid rather than try and make the latter on the estate. At the best an impure and crude form of acid in small quantities will be obtained, and the difficulties of fitting up a suitable still will probably prove too much for the average estate superintendent.

Care should be taken not to confuse Bisulphate of Soda with *Bisulphite* of soda which is used for securing a pale coloured crepe.

TEA SPRAYING.

In our issue of September 26th, we reproduced Dr. Hope's address on Tea Pruning before the Darjeeling Planters' Association and promised to follow this up with Mr. Tunstall's interesting address on Tea Spraying, which we now do. Our own Scientific Department has ever since the outbreak of Green Bug been so insistent on the necessity of being prepared with Sprayers and their ingredients, that, to find that advice equally strongly urged in a Northern Association, is confirmatory of the adage that to be forewarned is to be forearmed.

The whole address is interesting, but we do not intend to recommend one sprayer in preference to another; such advice coming more forcibly from our own Scientific Officer, but much can be learnt from reading the address as to cleaning of sprayers, and the care that should be taken to prevent the material of which the sprayer is made being damaged,

Hints are given as to the fineness of the spraying nozzle, the preparation of spray fluids, and the supply of fluid, the capital cost of spraying machinery in Calcutta, and the treatment of the bushes after having been cleared out.

Mr. Tunstall said :—

In no other Tea district is the treatment of fungus blights of such importance as it is here. The climatic conditions are such as favour the growth of fungi and other vegetable organisms injurious to higher plants. Examine almost any tea bush in the district and you will find one or more fungus blight attacking the leaves alone, while the stems are bound up with masses of lichen and moss. It stands to reason that if these unhealthy conditions were removed the plant would give more leaf. Dr. Hope has suggested better pruning, and the application of manure as tending to form a bush better able to withstand the attacks of disease. But however well the plant be pruned, manured and cultivated, the climate is such that parasitic; and epiphytic organisms will always be present, and will always require additional treatment. At present we know of only one satisfactory way of removing these organisms—by spraying with suitable chemical solutions. In the culture of many other plants, spraying has long been recognised as an essential part of the general routine, and it is hardly necessary for me to discuss the desirability of incorporating it with that of tea culture if labour, and other conditions permit.

In former years spraying has been attempted on many gardens but often the machinery employed has been inadequate and in many cases unsuitable, the solutions have been carelessly manufactured, and their application has been wasteful, and defective. It is not surprising that the results have been unsatisfactory, and that many planters have been led to the conclusion that spraying operations in Darjeeling are impracticable.

It is my aim during the next few minutes to shew you a few of the improvements in the machinery, and the methods employed and to convince you that spraying operations are by no means so difficult as one would first suppose. I will first discuss spraying machines. These may be divided into two groups, first, barrel, or tank machines, and secondly, knapsacks. Sprayers of the first class are not be recommended, and I will deal with them only to prevent planters buying them and being disappointed in consequence. They consist essentially of a force pump fixed to a barrel, or tank in which the spray solution is placed. The fluid is forced through long rubber hose pipes to the nozzles. These machines possess obvious disadvantages when used in tea. First, they are too heavy, and bulky

for convenient transport among the tea bushes, secondly, the hose pipes are unwieldy and handicap the operator so that it is almost impossible to spray the bushes quickly. The knapsack form has so far proved most satisfactory, and it is in these machines that improvement has been most marked. Knapsack sprayers may be divided into continuous pumping and pneumatic machines. The continuous pumping machines are unsatisfactory in that the operator cannot give his undivided attention to the direction of the spray jet. This disadvantage is the more noticeable on hill gardens where the foothold is often precarious and it is desirable to have both hands free. Although this type of machine has been improved greatly of late years I do not advocate its use for the above reason.

I strongly recommend machines of the pneumatic type. At present there are several good machines of this type on the market—the "Alpha" made by Messrs. Robinson Bros., West Bromwich, England, is sold at sixty shillings. I have a specimen of a small machine one which has been kindly lent us by Messrs. Shaw Wallace and Co., the agents for these machines. These machines are very simple in construction being merely strong air-tight vessels provided with an inlet, outlet, and air valve, and pressure gauge. To charge the machine the container must be partly filled with the spray fluid, and the inlet closed. Air is then pumped in by a foot pump or by a pump attached to the machine, until the required pressure is obtained.

This takes a very little time, and all the operator now requires to do is to direct the spray nozzle until the machine is empty. When the machine is opened for recharging, a quantity of air escapes, under the pressure and this means the loss of a certain amount of energy, and a method of avoiding this loss has been found in the "Battery" system. In this system there is only one opening which serves as both inlet and outlet. At the commencement of operations the machine is charged with air and the liquid is then forced in against the air pressure. As the machine empties a ball valve closes the aperture, thus retaining the air under pressure, it is then only necessary to pump in more liquid. One large pump which serves a dozen or more sprayers is generally used, but smaller sized pumps may be used with separate machines. The battery sprayer is, I think, the last word in spraying machines. Being absolutely simple, having no small tubes to clog, no fillers or sieves to give trouble, and few wearing parts to get out of order, it is undoubtedly the best type of machine on the market. At present the best battery machine is the "Holder," a modification of the Holder pneumatic sprayer. Each sprayer with accessories costs three pounds six shillings and six pence, while the central charging pump which may be used for any number of sprayers, costs nine pounds fifteen shillings. The "Alpha" makers, are, I understand, placing a battery sprayer on the market shortly.

The materials of which the machines are constructed must be such as resist the action of any spray fluid likely to be used, and this should be borne in mind when ordering spraying machinery.

Cleaning spraying machines.—It would seem hardly necessary to point out that spraying machines must be carefully cleaned at the close of each day's work, but I have frequently seen this neglected. The metal parts may be able to resist the action of a low percentage solution but not one of higher concentration. If drops of solution be allowed to stand

in the machine evaporation takes place, and the solution concentrates, often attacking the material. This is of extra importance in the case of pneumatic machines, as the container may be so weakened as to burst, and possibly cause serious damage to the operator.

Fineness of spray nozzle.—An important point is the fineness of the spray jet produced. It should hang over the bushes like a mist, it can hardly be too fine. It then settles on the leaves, and stems covering them with a very thin film. If the jet is too coarse the fluid will collect in drops leaving dry spaces between, and much more fluid is necessary to completely cover the plant.

Preparation of spray fluids.—The spray fluids must be carefully prepared if satisfactory results are to be obtained. Many of the more useful fluids may now be obtained in concentrated form, and in cases where their local manufacture is found difficult it would probably pay to go to the extra expense of buying them ready made.

As many of the preparations of this type on the market are unsatisfactory it is advisable to consult the Scientific Department before buying any particular one in quantity. I have a sample of Woburn Bordeaux paste here which is an excellent example of a preparation of this kind. This paste when mixed with water is an efficient substitute for Bordeaux mixture. It costs twenty-five rupees per cwt. in Calcutta. One cwt. is sufficient for 800 gallons of spray solution.

I will not here give specific instructions for the manufacture of spray fluids, as they will shortly appear in the pamphlet on spraying which as you are aware will be published later in the year.

Supply of fluid.—The organisation of the supply of fluid for machines at work in the tea is of great importance. To reduce the labour to a minimum requires very careful supervision.

The number of bushes which a sprayer can do at one filling may be found by experiment. The day's work may then be calculated out beforehand so that the solution is always in the right place, and no time is lost in unnecessary walking about.

Carrying the solution from the factory to the tea in tins or barrels has been the usual procedure in the past, and when operations are on a small scale it works very well; but when hundreds of acres are to be treated it is necessary to find a cheaper way. On some gardens well supplied with water it has been found advisable to place tubs at intervals in the tea. These tubs when filled up to a mark with water contain a known volume. Packets or bags each containing the correct amount of chemicals necessary for one tub of solution are weighed out at the factory. In case of chemicals which take a long time to dissolve, such as copper sulphate, it is better to make up strong solutions of a definite concentration and put these in bottles or earthenware vessels—a measure holding the correct amount for one tub being supplied.

Permanent pipe lines.—In some gardens it may be desirable to lay down permanent pipe lines, to central position in the tea. A flexible hose could then be attached to tap, and the water conveyed directed to portable tanks.

Motor pumps.—On less compact gardens the provision of a small portable motor pumping outfit with a portable pipe line would be more desirable. For some time I have been corresponding with various engineer-

ing firms about suitable outfits and in a short time I hope to be able to test some of these. Their cost is small compared with the labour saved.

Preserving iron tanks.—If iron tanks or tins are used for spray solutions the iron must be protected from their action by a coating of some kind, otherwise the solution will be affected, and in some cases rendered useless. There are one or two good preparations for the purpose on the market.

Dry powders.—There are some places where at certain seasons of the year it is almost impossible to obtain water in sufficient quantity for spraying operations. In these somewhat rare cases I would recommend the use of dry powder instead of solutions. These are best applied by dusting machines. I have two excellent examples of this type of machine here—the "Holder Dry Duster" and the "Mollenkamp" each costing Rs.30 in Calcutta. Powders as a rule are not so effective as solutions.

These dusting machines may be used also for the distribution of artificial manures.

Capital cost of spraying machinery.—The initial outlay for good spraying machinery is considerable, but including sprayers, tanks, motor pump, and pipe lines, the capital cost for a 500 acre garden would not exceed Rs.3,000.

Cost of spraying.—The cost of making one application of Bordeaux mixture is under Rs.3 per acre. Soda solution costs considerably less.

Treatment suggested.—I would suggest that in this district all cleaned out tea be sprayed with soda solution immediately after pruning. This will remove the mosses and lichens which restrict the flow of sap. At about the same time the unpruned may be sprayed with Bordeaux mixture. A second application of Bordeaux mixture should be made this time to the whole area after the first flush has been removed. The average yield per acre of tea in this district is at present very small and there is every reason to suppose that a combination of scientific manuring, pruning and spraying would very considerably increase it without affecting the quality. All garden relations are interdependent and I am not suggesting that spraying is all that is necessary to reduce or remove blights. It is only one of the necessary components of the general routine. There are some gardens in this district where the carrying out of spraying operations would be analagous to giving a sick man medicine while unable to give him proper food. On such gardens improvements in other directions are necessary before general spraying is attempted. There are, however, many gardens and their number will increase every year where it is possible to incorporate spraying with the general routine without interfering with other operations.

The initial outlay and the running expenses of spraying operations are not high when one considers the probable benefits to be obtained. Again consider the present state of unpreparedness of tea gardens not only here; but in other districts also. Suppose a really serious blight appeared—a blight which not only attacked the leaves, but killed the whole plant and spread with the rapidity of blister blight. How could it be checked? The apparatus at present available would be as a single bucket against a forest fire. The provision of adequate machinery for the treatment of plant disease is a *form of insurance* which should on no account be neglected.

RUBBER.

The following information is extracted from the pages of the *India Rubber Journal* to hand by the mail: In the Rubber Trade everything is much more cheerful than for some considerable time, and a little ordinary business has commenced to come through. The business done and doing for War purposes is extraordinarily large and those Firms who have been favoured with War Office business continue to be overwhelmed with orders. There are signs of revival in the general trade which promises to strengthen as the country gets farther and farther away from the war crisis.

While not altogether blocking the supply of raw rubber to Germany and Austria-Hungary, the new prohibition against the export of rubber will stop one of the main avenues through which the enemy might have been able to obtain supplies. The prohibition applies to all foreign ports in Europe and on the Mediterranean and Black Seas other than those of Russia (except Baltic ports), Belgium, France, Spain and Portugal. Neutral countries must to some extent suffer from the effect of the Proclamation. The step, though a necesary one, will also react on ourselves in so far as London is the world's central market for rubber and also because British interests are the largest producers and sellers of the commodity.

The German imports of raw rubber last year amounted to about 29,000 tons, and the re-exports to 10,163 tons, making the presumptive consumption somewhat less than 19,000 tons. The German exports of manufactured rubber goods last year totalled 410,196 cwt. and were valued at £6,753,700. As her overseas markets have been lost to her it may be supposed that Germany's requirements of raw rubber will not be so great as formerly; on the other hand however, there are the abnormal war requirements of rubber goods to make up the deficit of business.

According to advices received by the *India Rubber Journal* from Amsterdam, the local price for first latex plantation crepe is in the neighbourhood of 4s. per lb. A strong demand exists, doubtless on German account. In well informed Dutch quarters there is a belief that home coming liners will shortly refuse cargo for ports in Holland. It is thus evident that the steps taken by the British Government are making their effect felt, and that a rubber famine has already commenced in Germany. The handicap necessarily inflicted on the small Dutch rubber manufacturing industry will be regretted.

STRICKLAND (C). Short Description of the Larva of *Lophoscelomyia asiatica*, Leicester 1905, and Notes on the Species—*Parasitology, Cambridge*, vii, no. 1, May 1914, pp. 12-16, 3 figs.

The author describes the larva of the bamboo-breeding *Anopheles* (Myzorhynchus) *asiaticus*, which he obtained from a cut bamboo at Ginting Simpah, F. M. S., at an altitude of 1,500 feet. One full-grown larva was observed to remain for about four weeks without pupating; the author placed it in a bottle and found that while kept in the light for another week it still remained in the same state: when, however, it was put in the shade it pupated immediately and two days later the imago had emerged. It seems that light has an inhibitory action on the pupation of this species, a suggestion that is in keeping with the fact that larvae in the cut bamboo always took refuge in the dark end. Light seems to have no inhibitory influence on the early growth of the larva; three very small larvae were kept in a bottle in the light and grew very well; they pupated after 35, 41 and 43 days respectively.—*The Review of Applied Entomology*.

CORRESPONDENCE.

A Suggested Contribution of Coffee.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—May I make a suggestion to all owners of Coffee Plantation in Coorg, which is that they should each contribute for the use of the troops at front, the first fruits of their coming crop—say the first hundred weight picked in each Estate.

I am sure Messrs Matheson & Co. who have complete machinery at their works at Hunsur would undertake to roast and grind and enclose in suitable tins, this coffee, at cost price, and forward the same to the right quarter, the cost to be guaranteed by the donors. (It should only be a matter of a few rupees per Cwt.)

Every owner big and small, European and Native should join in this and each District or Group of Estates should make their separate arrangements for collecting and forwarding the coffee to the Hunsur works.

The idea is to send a contribution of coffee in a condition ready for consumption direct to the troops at the front for their comfort, the same as Chocolate, tea, cigarettes and other comestibles.

Yours faithfully,

G. K. MARTIN.

Mercara, 6—10—1914.

A Grievance.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—These are the days of grievances. What with the increased freight charges on teas, difficulties with drafts, and possibilities of low prices, I have one to add to the very many already sore subjects with tea planters. My grievance is the present price of tea lead, as shown by two quotations I have before me, both over Rs, 100 a ton more than July prices. Can any of your readers tell me the reason? Is it because stocks are low (yet I learnt one of the two firms had big stocks in hand and more to arrive) or is it that, being good patriots, these firms seized the opportunity to squeeze still more profits out of the unfortunate tea estates? If the latter, their methods are of the bazaar type, which so recently had to have some Government attention for unduly raising prices.

Yours faithfully,

"INQUIRER."

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED,

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

VOL. IX. No. 43.] OCTOBER 24, 1914. [PRICE AS. 8.

THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department gives a notice of Mr. Bainbrigge Fletcher's South Indian Insects, which was noticed by us when having had the pleasure of a visit from the author and then recommended the book to the notice of every planter in Southern India, and we are pleased to see that the Scientific Officer does the same.

The method of treating stump rot in tea is noticed, and a note on the inaccuracy of newspaper information sometimes is pointed out.

The Commercial aspect of coffee is continued and many statistics are given. The gigantic deal in coffee is mentioned as having no parallel in produce, but Mr. Kenna's big deal in sugar lately, though it does not approach it in value, has consequences which affect the universal use of this product. The operation of the New York Coffee Exchange is very interesting. London as a coffee centre is very low down in comparison with New York and comes after Havre and Homburg.

The conditional contraband of Rubber, and the necessity of declaring this commodity as conditional contraband is quite obvious.

We hope that now the Director of Labour Department and his assistants have arrived, much information will be conveyed to subcribers through the medium of these columns. Those wishing to telegraph to any of them should carefully note the abbreviated addresses given in this number.

As a continuation of the housing and general welfare of estate coolies, we publish an article on the feeding and care of infants.

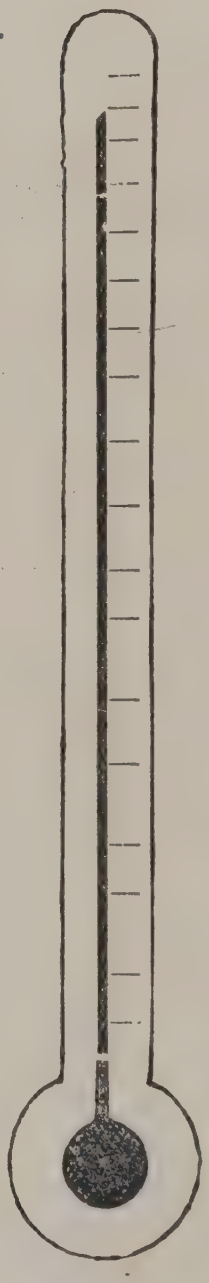
An interesting article on the effect of one crop on another is extracted from the *Journal of Agricultural Science.*

We publish a letter from Mr. B. deCourcy about sending tea to the Russian Troops, for the information of those who may wish to do the same, and enclosing a letter from the Vice-Consul of Russia in Colombo.

BAROMETER

OF

Labour Department.



	100,000
8-8-14	96,243'78
25-7-14	95'471
11-7-14	95,434'21
4-7-14	94,450'41
27-6-14	90,219'41
20-6-14	89,619'41
13-6-14	88,574'41
6-6-14	86,429'41
30-5-14	84,867'41
23-5-14	82,851'41
2-5-14	82,293'90
25-4-14	79.820
18-4-14	77,958
11-4-14	74,607
4-4-14	73,057
28-3-14	68,757
21-3-14	68,611

The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

South Indian Insects.

Under the title of "Some South Indian Insects." Mr. Bainbrigge Fletcher R. N., the Imperial Entomologist, has written a book which fills a gap in Entomological literature which badly needed filling. Hitherto the layman had much difficulty in finding out the name or anything about even common insects, and the only reference book of anything like a popular nature was Lefroy's "Indian Insect Life." With Mr. Fletcher's book to refer to this difficulty should now be largely reduced as far as commonly occuring insects in South India are concerned.

It is a book which should appeal to the planter for it is largely designed for his benefit. The preliminary chapters give a simple and easily understood general account of the structure and habits of insects and insect pests. This is followed by a most instructive chapter dealing with the control of Insect Pests of crops, describing all the different methods of control by mechanical means and by sprays. As an appendix to this chapter is published a list of weights and measures which will be found most useful. Many times during the year enquiries are received at this office asking how much a litre may be, or how big a hectare. In this appendix all this information will be found.

In the succeeding and main portion of the book some of the more important insects are described, each being treated under the head of (1) References, (2) Distribution in South India, (3) Life history, (4) Food plants, (5) Status from an economic point of view, and (6) Control. With each description there is a plate in nearly every case and there are many beautifully reproduced coloured plates.

To take an example, we find on turning up the 'Coffee Borer,' that there is an excellent plate of *Xylotrechus quadripes*. with the following text.—

"*Distribution*—Throughout the Hill districts of Southern India. Usually two broods, about March and October.

Life history & Food plant.—Eggs laid in stems of Coffee bushes about ground level. Grubs bore in stems and branches, being well-known in Coffee districts as "the Borer."

"*Status.*—A serious pest to Coffee.

"*Control.*—Cutting out of attacked bushes, collecting of adult beetles by hand, regulation of shade over Coffee, scraping and white washing of bushes just before eggs are due to be laid."

The book concludes with a list of crops with the insects which are known to attack them. As the Author points out, "this list of Crop Pests is not complete and it cannot be complete for very many years if ever. Every month new pests come to light many of them altogether unknown even by name, and our knowledgo of old pests is augmented."

The volume is published by the Government Press, Madras, and costs Rs. 6 and we strongly recommend every planter to get it and study it in relation to the insects, pests and otherwise, which are to be found on his estate. As the author says, "To any in search of a distraction or a hobby, either to fill an idle hour or to provide a welcome change of thought and occupation, the study of Entomology may well be commended. Insects are always with us, by day and by night, in the bungalow, at the office or in camp, and the field for observation of life histories and habits, even of the commonest species, is absolutely boundless."

Stump Rot in Tea.

An enquiry has recently been made as to the best method of procedure to deal with an attack of root disease on a Tea estate. Root diseases often begin near the old decaying stump of a tree, either one of the original jungle stumps, or a shade tree which has died, or been purposely killed. Whenever possible such stumps should be removed altogether with as many roots as possible. Where this is not possible a trench at least three feet deep should be dug completely round the stump and kept open till the stump has entirely decayed.

When the disease attacks a tea bush this latter should be dug out, with as many roots as possible, and burned. If the disease is spreading and forming a patch it is advisable to isolate this patch by means of a trench, enclosing all the diseased bushes and a ring of apparently healthy ones also on its boundaries, the soil taken out of the trench being thrown into the enclosed area.

Where a dead bush has been removed the soil should be forked up to a depth of two or three feet and heaped up and unslaked lime mixed with it. The heap should be left exposed to the air and sun throughout the dry season. At the same time the soil in the diseased patch should be well forked up and unslaked lime at the rate of two lbs. per square yard applied. It is also advisable to improve the drainage of such areas.

The length of time which should elapse before such infected patches can be safely replanted depends upon the extent of the infection. As a rule if the soil is forked over again, and slaked lime applied to it at the end of the dry season supplies put in will grow successfully. If the infection was very bad, however, and all the roots and dead and diseased wood in it were not removed these supplies are apt to be attacked again, in which case the process must be repeated for another year.

Newspaper Science.

The stuff served up as 'Science' in the daily press is often amusing, but it is not often that an Agricultural paper is caught napping quite so badly as was one which came to hand recently by the mail. The following gem is quoted in it from 'Exchange.'

A Perfect Fertiliser.

"Professor Bottomley's discovery of a perfect fertiliser is of intense interest to Australia. He has produced a bacterialised peat, which absorbs the nitrogenous wealth of the atmosphere. The exhaustion of nitrogen by crops is the cause of the decay and death of soils. For soils die just as do all other living elements in nature. They become senile, because of exhaustion. The purpose of fertilisers is to arrest that exhaustion, and to revivify the earth. Rain always brings down large quantities of the free nitrogen of the atmosphere; hence its incalculable value as a revivifier of the land. But much of the nitrogen thus brought down escapes. With a fertiliser such as that now discovered by Professor Bottomley, the nitrogen cannot easily escape before it becomes absorbed by the soil. "Exchange."

This may be meant for a joke, but as an example of inaccuracy and confusion of ideas it is difficult to beat.

RUDOLPH D. ANSTEAD,
Planting Expert.

COFFEE.

The Commercial Aspect of Coffee.

Scholarly and extremely interosting lectures by J. H. Brindley, Manager of Coffee Department of Brooke, Bond & Co., London, England, before School of Economics, London University · Printed herewith by special privilege of the Author.

Valorisation.

Of the valorisation of coffee, its cause and its effect, so great a mass of facts have been quoted and so many diametrically opposed opinions expressed, that it will be impossible for me to more than touch on its salient features and refer the more serious students to the chief sources of my own information, whieh are; "The valorisation of Coffee in Brazil" by Dr. Ferreira Ramos, published by authority in Antwerp in 1907; "Brazil," by Pierre Denis (T. Fisher Unwin, 1911), and Bulletin 79 of the Bureau of Statistics, United States Department of Agriculture, a valuable work on coffee production, trade and consumption, issued at Washington, December, 1912.

Following the final abolition of slavery in Brazil, which did not take place till 1888, a great activity, both national and individual, largely concentrating itself on coffee, was manifested. Not only was the free labour of greater intensity and better type, but emigration chiefly from Spain and Italy was encouraged by land grants and by free and assisted passages, so much so that at least 250,000 Italians besides Spanish and other nationalities were attracted to the State of Sao Paulo alone.

New plantations were opened with feverish activity, and virgin ground further and further afield brought into cultivation, while older and partially exhausted estates were abandoned by their owners for more productive, deep, red-loamy soil, which was proving so wonderfully responsive to coffee culture. Of course, the effect was not immediately apparent, for from first clearing the ground till a reasonably good crop a period of five years would elapse, but a glance at the statistics shows that the Brazil crop in 1893—94 was 4 309,000 bags and the price of No 7 grade Rios in New York 16½ cents. In 1897—98 the crop had more than doubled to 10,462,000 bags and the price receded to less than half, at 6¼ cents. Nor was production anything like stationary at that; after a decline for two years it again mounted higher and higher till in 1901—02 came the cruelly bountiful and unprecedentedly heavy crop of 15,439,000 bags for Brazil alone. Frost or tornado diminishing the harvest by 50 per cent. would have been a blessing in disguise! All calculations were upset and prices fell lower and lower, to such an extent as to threaten at least partial ruin to planters and labourers alike. The Government of the State of Sao Paulo intervened with the object of limiting or prohibiting the development of new ground, even forbidding the replacement of perished bushes for a period of five years, and by prohibiting the sale of all coffee below a recognised standard.

This was a palliative, but no cure. Had coffee been an annual crop, such as wheat, rice, beet or potatoes, the problem had been a simple one. A crop of some other product for one season only would have restored the equilibrium, but to destroy or abandon sufficient coffee to allow a reduction of the harvester crop by even one million bags, would have meant the loss of a vast public fortune perhaps never to be recovered.

In 1903 it was proposed that the Brazilian Government should agree with a syndicate of capitalists to buy on Government account all coffee

shipped from Brazil on a commission basis, and that the expenses thus incurred should be met by an export tax on the commodity. This scheme however, never materialized.

In 1905 it was proposed that the State of Sao Paulo should borrow £15,000,000 sterling for the purpose of buying coffee and holding it for higher prices. A German bank offered to finance the loan if the Federal Government would guarantee repayment, and with a view to securing this was held the famous convention at Taubate in February, 1906. Here the Presidents of the States of Sao Paulo, Minas Geraes and Rio de Janeiro met and adopted a programme of 15 articles and several sections on the lines indicated. Opposition, however, developed and especially to article 8, which contemplated the establishment of a bank of conservation, to be created by the National Congress for the purpose of fixing rates of exchange. By May, 1906, the heavy picking of the record crop of 19,654,000 bags had begun and modifications were proposed by the State of Sao Paulo and adopted by the other contracting States in July, 1906.

Thus modified, the articles were approved by the National Congress, but in the meantime the German bank withdrew its offer. Rothschilds were approached, but would not entertain it. Prices were falling lower and lower and matters were so urgent that the State of Sao Paulo decided to carry out its own valorisation programme. In August 1906, she borrowed £1,000,000 from a German syndicate and in December £2,000,000 from London and £1,000,000 from New York. By the end of February, 1907, the State had purchased upward of eight million bags (8,146,123) and within a few months a further 328,500 bags, making in all 8,474,623 bags, and nearly all was shipped to New York, London, Hamburg, Bremen, Antwerp, Marseilles and Trieste.

In October, 1907, the State of Sao Paulo obtained a loan from London bankers and £2,000,000 from a French-American syndicate.

In July, 1908, the Senate and House of the State of Sao Paulo passed a law authorising a new and larger loan of £15,000,000 sterling to "complete the necessary measures for the protection of coffee and to convert into a consolidated debt the floating debts or operations of credit which have been used for the same purpose." Under Section 2 of Article 3 it was agreed that "The product of the sales of coffee belonging to the State shall be applied to the amortization of this loan."

The export tax of three francs per bag, which had been instituted in 1905, was raised to five francs per bag on all coffee exported from the State. It was provided that the custody and sale of the coffee should be in the hands of a committee of seven members, three to be appointed by Messrs. J. Henry Schröder & Co., three by the Société Générale of Paris, and the seventh by the State of Sao Paulo, the last having power to veto or hold in check the action of the other members, and in case of need the Bank of England was appointed to act as arbitrator.

The history of the world contains no parallel for so gigantic a deal in produce. Economists condemned it, traders anathematized it, but the impartial critic will allow that a desperate situation had been brought about by artificial causes and natural conditions combined, and as desperate diseases justify desperate remedies, the hazardous surgical operation of the Valorisation Act was justified, and that time has put its seal of justification on it.

Doubtless the distributing merchants, roasters and retail trade, especially of the United States, France and Germany, have been greatly harassed

by its operation, and it is quite likely that the committee would have been well adviced not to so conserve their holdings as to force prices up to the high levels reached during 1910 and 1911 and the early months of 1912. Had the natural law of supply and demand been allowed to operate unimpeded, prices would certainly have been disastrous for a time, but the absorption of the surplus by merchant and dealer, and its distribution to the consumer at lower prices than have now been possible, would have sooner restored the equilibrium, increaseed consumption and rendered less profitable the manufacture and curtailed the sale of the many substitutes used in the States and on the Continent as alternatives to or adulterants of the genuine article. (In England no other mixture than chicory is legal as a cheapener of coffee, except under labeling regulations, making it unprofitable.)

Anyway, there seems to be a consensus of opinion that this great inspiration, experiment, or adventure, though justified by results, is not likely to be repeated in this or any other similar product of our time.

Before leaving the subject, however, it is necessary to say that even now the valorization committee has by no means concluded its labours. Purchasing closed in 1907. In 1908, 1,174.000 bags were sold, and succeeding sales at intervals brought down the stock to 5,101,460 bags at the end of 1911. During 1912, 725,565 bags were sold, 4.377.908 bags to commence 1913 with. A further 1,235,675 bags were sold in February of that year, leaving the present balance of 3,142.228 bags, and when the last Sao Paulo loan was issued in May, 1913, it was stated that no further sales would be made before 1915. The Presidential message of July 14, 1913, states that the value of the coffee remaining to be realised is ample for the complete amortization of the £15,000,000 loan, and to leave a balance in favour of the State Treasury.

The speculative markets in New York, Havre, Hamburg, and London can only to a limited extent be rightly described under the head of "Commerce in Coffee," so small is the actual delivery of the article in proportion to the enormous quantity bought and sold.

Operations of the New York Coffee Exchange.

New York Coffee Exchange, being the largest concern of the kind in the world, we will look at its *modus operandi* and take it as typical of the rest. Founded in 1881. it now occupies the whole of a large and convenient building in the coffee centre of New York at Pearl St. It is governed by a board of management having Wm. Bayne, Jr.. as President, and C. B. Stroud as Superintendent, and various committees under the divisions of finance, law, trade and statistics, spot quotations, future quotations, membership, arbitration, etc.

The visitor will find a gallery provided for him whence he may view a large hall with lofty ceiling and scarcely any furniture besides a number of desks and telephone boxes around the margin. In the centre are two sunk rings in the floor encircled with brass railing. These enable buyer and seller to see and hear each other the better. At the opening of business and to the second of time a gong sounds and traders commence operations. Sales and purchases may be for present month or many different months up to a year in advance. The price is in cents per pound and varied up or down by hundredths, but not to a smaller fraction than 5/100. The minimum quantity is 250 bags, and it is claimed that the buyer or seller of such a lot is on an equality with the operator of 2,500 bags or more.

This Exchauge has brought the standardisation of coffee to a fine art, and the number of grades which are recognised are eight, of which No. 1 is

the best, and theoretically without imperfections. These vary in an ascending proportion from six per pound in No. 2 to about 200 in No. 7 and 400 in No. 8.

Usually No. 7 is the grade dealt in, but it by no means follows that a purchaser will get delivery of the grade he buys. The seller may deliver any grade from one to eight, allowing or taging the difference in value. Buyer and seller must, of course, make a marginal cash deposit, and pay further cover if the market goes against him. Each agrees to accept the official arbiter's decision in case of dispute. An enormous quantity of statistics are available to the members. Telegraphic advices and cables constantly pour in, while round the walls are blackboards on which are posted not only the movements of coffee ashore and afloat throughout the world, but daily details of the weather in the various Sao Paulo growing districts, such as Campinas "fine," "showery;" Jaboitcabal and Avare "cloudy;" Rio Claro "fine;" Ribeirao Preto "rain." Rate of Exchange on London is also given, and particular attention to dealings reported from Havre, Hamburg and London. In one day of February, 1904, sales of 687,000 bags were made. The highest quotation ever recorded there was 22·25 cents in December, 1887, and the lowest 3·55 in July, 1913.

It is claimed that "merchants, who must and do, carry large and desirable stocks to protect their trade and themselves against the 'book of accidents' can use the medium of the Exchange to insure themselves against loss and be always able to carry an abundant and desirable stock at a time when such is plentiful, and thereby safely protect themselves against shortage without risk."

On the other hand, a speaker at the last convention of coffee roasters of the United States, held at Cincinnati in November, 1913, said: '"Many believe that the greatest detrimental conditions ever created in the coffee trade would not have succeeded if it had not been for the speculative control of the Coffee Exchange. The report for last year states that over 22,000.000 bags were traded in on the New York Coffee Exchange, and about 250,000 bags of coffee were actually delivered on contracts." Thus it seems that on one Exchange alone about five million bags mors than the whole world's crop were nominally traded on the comparatively small quantity of a quarter of a million bags of actual coffee.

London would rank a long way down in comparison and comes after Havre and Hamburg. The London Produce Clearing Houre, which does this class of business, does not confine itself to coffee. It includes beets granulated sugar, black and white pepper and silver in its activities. Its sales of coffee during 1913, however, were over three million bags. A few years ago an attempt was made to include tea in the list, but the difficulty of standardisation was too great and the endeavour had to be abandoned.

Whether regarded with condemnation or approval, it is safe to say that the speculative market has a real and rapid influence on prices, at any rate on the lower grades of coffee. The daily quotations, and their upward or downward trend, reflect the current opinion of some of the acutest men in the world, and as I would rather infer from the odds a sportsman offered as to which crew were the likeliest to win the boat race than from columns of prejudiced descriptive writing, so I think the merchant and dealer in coffee does well to be conversant with the movement of prices in future, even though he be no speculator in them.—*Simmons' Spice Mill.*

(To be continued.)

RUBBER.

Conditional Contraband.

Our readers are aware that raw rubber is now conditional contraband as well as foodstuffs, such as coffee and sugar. The necessity of declaring these commodities as conditional contraband is quite obvious. The declaration has a very serious interest to all planters not only in the Middle East, but throughout the tropical world generally. It has to be borne in mind that coffee and sugar, as far as the Middle East is concerned, are mainly grown in Dutch possessions, Java and Sumatra. Rubber; it is true, is grown to a greater extent in British than in any other possessions, but in Java and Sumatra it is grown as one of the principal cultivations, and British interests in Hevea cultivation in those islands is very great.

The position at present is simply that any ship containing rubber, coffee or sugar destined to any neutral port is liable to seizure by any of the Allies' ships. A case in point recently occurred where a Dutch ship carrying coffee from Java to Amsterdam was seized by the French Fleet, who ordered the coffee to be unloaded and landed at Brest. It so happens, according to the information supplied us, that this coffee was owned by a British Company which had from its inception sold its coffee in Amsterdam. It is therefore clear that all raw rubber or foodstuffs of any description of use to the enemy will be seized and the owners thereof must, before they can regain possession of their goods, produce the necessary papers to satisfy the authorities at the French, Belgian and British ports that the products will be used only for the Allies or for neutral countries. If, for instance, the cargo is consigned to a firm in Holland, it cannot be delivered in Holland until the Dutch Government guarantee that the produce will be used exclusively in Holland. It will, as far as we can see, be necessary for neutral countries to prohibit the export of any of the products we have mentioned. The guarantee of the Dutch Government can be given through its Minister in any country where the goods may have been unloaded. It is clear that the Allies, owing to their command of the sea, intend to take every possible step to cut off the raw supplies for the enemy. This necessitates their calling upon neutral countries to give a guarantee that the raw supplies will be used only by them and not allowed to be exported to any of the enemy's countries.

As far as sugar and coffee are concerned, Holland can consume quite a large quantity, but it is equally clear that it cannot consume the quantities it has been in the habit of receiving in years gone by.

As far as rubber is concerned, it is well-known that there are very few manufacturing concerns in that country, and these are not able to use up the rubber which is usually shipped to Holland from its own possessions, and those of other countries. Under these circumstances, our readers will not be surprised to learn that first quality plantation rubber is to-day fetching in Amsterdam 4*s*. per lb.

We are advised by our correspondent in the Dutch East Indies that certain lines of steamships have been instructed not to accept any more cargo for London. Furthermore, orders have been issued which will result in delay as far as consignments due in England during November are concerned.—*India Rubber Journal*,

LABOUR DEPARTMENT.

For the information of subscribers to the Labour Department.

Please note that Mr. Aylmer Martin is in charge at Bangalore, and will work Mysore Labour Districts himself. Mr. E. H. F. Day is in charge at Coimbatore, and will work the Labour Districts of Malabar, Coimbatore, Salem, N. W. of Trichinoply (taluqs of Namkal and Karur), the Palni taluq of Madura district, and the Territory of Cochin. Mr. Ward is at Srivilliputtur, and will work the Labour Districts of Madura, excluding Palni taluq, all Ramnad, and North Tinnevelly. Mr. Prince at Nagercoil will work South Tinnevelly and Travancore.

The gentlemen appointed to other Labour Districts will take charge later on, when information of the fact will be given.

Abbreviated telegraphic addresses are as follows:—

Mr. Martin:	"*Upasi*"	*Bangalore.*
Mr. Day:	"*Upasi*"	*Coimbatore.*
Mr. Ward:	"*Upasi*"	*Srivilliputtur.*
Mr. Prince:	"*Upasi*"	*Nagercoil.*

AYLMER MARTIN,
Director.

Bangalore, 22—10—14.

FEEDING AND CARE OF INFANTS.

The *Planter's Chronicle* has already shown the necessity for care in the housing and for the general welfare of Estate coolies. Infant mortality has had special attention.

The following is taken from the official instructions issued by the Local Government Board in Ireland.

Feeding.—Cow's milk is the best available substitute for the mother's milk. It must be procured fresh and pure at least twice daily, and should not be more than twelve hours old.

Milk, when not cleanly handled, soon sours and spoils. It must, therefore, be kept very clean and cool in a covered vessel.

Unless milk is known to be fresh and pure, it must be boiled for safety, and then rapidly cooled by standing the vessel containing it in cold water.

In summer the necessity for boiling the milk should be specially observed.

When infants over two or three months old are fed *continuously* with boiled milk, they should be given a little orange juice or some substitute for this two or three times a week.

To make cow's milk suitable for infant feeding, it is required to be modified. The excessive proportion of cheese or curd must be reduced by dilution with water, the deficiency of fat caused by the dilution must be restored by the addition of cream, and chunam-water should be added.

But when fresh cream is not available *modified* cows' milk may be simply prepared by removing (in the case of infants up to three months old) the upper *third* (see A in Food Table below), and, (in the case of infants between three months and nine months old), the upper *half* (see B in Food Table) from fresh cows' milk which has been set aside in a glass measure, covered, in a cool place for three hours, and mixing it with water, sugar, and lime-water in the proportions stated in the Food Table according to the infant's age.

The top-milk and water, with sugar, are brought to the boil, and when rapidly cooled the chunam or lime water is added.

One half the 24th hours' food might be prepared at a time—morning and evening.

The infant's milk when prepared must be kept cold between the meals, and only the quantity required for one feeding should be put into the feeding bottle at a time. While feeding, the bottle should be held so that the teat is always full, and the food should be given lukewarm.

To properly carry out these directions a graduated eight-ounce measure is required.

The feeding bottle should have a wide mouth, with opening at both ends for easier cleaning, and should be shaped, so that the infant must be fed by the nurse and not left with the teat in its mouth to feed itself. There should be no cork or rubber tube to get fouled, The teat should be capable of being turned inside-out when washed.

The size of the hole in the teat is very important. The milk should flow out of the teat at the rate of about a second for each drop when the bottle is turned upside down.

Two bottles at least must be provided for each infant, and the bottles and teats must be thoroughly cleaned and scaled after each feeding. One bottle must be always kept clean and ready for use in a vessel containing boiled water and a little bread soda.

Weighing the infant is invaluable as a guide. If the infant do not *gain* steadily in weight, it must be taken for medical advice to the Dispensary. During the first six months the weekly gain should not be less than four ounces. A healthy European infant at birth averages between six and seven pounds in weight, and at twelve months old the weight is about twenty-one pounds. The Indian baby somewhat less.

The motions from the bowels should be carefully watched. Diarrhœa or constipation is usually caused by improper feeding and when either is continued medical advice must be obtained.

General Care.—The infant should be carefully washed in a bath of warm water, with free use of mild soap, every day. Soiled cloths should be removed immediately, and the attendant's hands then washed. The infant's clothing and bedding should be clean and dry. The clothing should be warm, soft, and loose; and the limbs should be properly covered.

The infant should be kept in the open air and sunshine as much as possible, when the whether is suitable, but duly protected from cold, and strong sunrays. It should not sleep with the mother, or person in charge, but separately. The window of the room should be open a little at night, but the infant should not be placed in a draught.

FOOD TABLE (HOLT.)

Age.	Modified Cows' Milk according to Infant's age.	Intervals between Meals from 7 a.m. to 10 a.m.	No. of night feedings.	No. of feedings in 24 hours.	Quantity for one feeding.	Quantity in 24 hours.
1st Week.	2 oz. Upper Third Milk (A) with 1 oz. (2 level tablespoonsful) white sugar, 1 oz. Lime Water & Water sufficient to make up 20 oz. ...	2 hours.	2	10	1 oz. to 1½ oz.	10 oz. to 15 oz.
2nd & 3rd Weeks.	4 oz. do do ...	2 ,,	2	10	1½ oz. to 3½ oz.	15 oz. to 35 oz.
4th & 5th Weeks.	5 oz. do do ...	2 ,,	1	10	2½ oz. to 3½ oz.	25 oz. to 35 oz.
6th Week to 3rd Month.	7 oz. do do ...	2½ ,,	1	8	3 oz. to 5 oz.	24 oz. to 40 oz.
3rd Month to 5th Month.	10 oz. Upper Half Milk ... (B) do do ...	3 hours.	1	7	4 oz. to 6 oz.	28 oz. to 42 oz.
5th Month to 9th Month.	12 oz. do do ...	3 ,,	0	6	5 oz. to 7½ oz.	30 oz. to 45 oz.
9th to 12th Month.	16 oz. Plain Milk do (with half the quantity of Sugar)...	4 hours.	0	5	7 oz. to 9 oz.	35 oz. to 45 oz.
	A little Panada, Corn Flour, Arrowroot, Yolk of Egg, etc., may also be given ...					

THE EFFECT OF ONE CROP UPON ANOTHER.

By the Duke of Bedford and S. U. Pickering.

The effect of growing grass over the roots of fruit and other trees has been under investigation at the Woburn Experiment Fruit Farm, Ridgmont, since 1895, and the Thirteenth Report of that Farm, 1911, contained a general account of the results obtained up to date.

There is no doubt that this deleterious action of grass varies greatly with the nature of the soil, though it is questionable whether in any case the effect would be *nil*: it is considerable even when the trees and grass are grown in pure sand, and fed with artificial fertilisers. It varies in extent with the nature of the trees, though none have yet been found which are not seriously affected by grass, under certain, and, generally, under most, circumstances. In the same way, the nature of the grass—eighteen varieties were examined—has only a minor influence on the results, the action of the weaker and shallower-rooted grasses being still very considerable.

At the Fruit Farm, which is situated on the Oxford clay, the effect of grass is nearly, and often actually, fatal to trees. Young trees grassed over at once after planting have their growth almost entirely arrested, and the grassing of trees which had been growing vigorously in tilled soil for four years, in one case, and for twelve years, in another, was found to produce the same result, the trees in the case of several varieties being actually killed. The effect of grass is noticeable even when a very small proportion of the roots of a tree are in grassed soil; but, on the other hand, recovery from the effect begins as soon as ever any of the tree-roots find themselves in tilled ground.

The stunting action of the grass is accompanied by other indications of starvation; the foliage and bark are of an unhealthy, light colour, and there is a marked deficiency of green colouring matter in the fruit; but it is a case of starvation in a land of plenty, for, not only were all the experiments arranged so as to prevent the soil from being impoverished by the grass, but it has been found that the soil under the grass is actually richer than that in the tilled plots, and, if samples of two such soils are taken, and trees grown in them, those in that from the grassed plots exhibit about twice the vigour of those in the soil from the tilled plots.

The possibility of explaining the results by a difference in the water-contents of the grassed and tilled soil has been negatived by numerous experiments, both with trees grown in the open, and with others grown in pots, where the water-supply and also the food-supply could be strictly regulated. In some of these latter experiments the grass-roots were prevented from intermingling with the tree-roots by placing a piece of fine gauze between the two; yet in spite of this, and in spite, also of all water and nutriment being supplied from below, so that the tree got all that it wanted before any reached the grass, the effect of the latter was nearly as great as in other cases.

Other possible explanations have been investigated, but have all been found to be insufficient: these included the questions of soil-temperature, alternation in the aeration of the soil, accumulation of carbon dioxide in it, its alkalinity or acidity and any alternation in its physical nature. The apparent absence of possibilities, combined with the general features of the action, led to the conclusion that this action must be due to some toxin produced by the grass: not necessarily, however, to any actual excretion from the roots for a toxin might be produced either by the decay of the

debris of the growing roots, or as a result of an alternation in the bacterial centents of the soil incident on the growth of the grass. It was possible, too, that the grass might become virtually toxic to the trees by taking up from the soil certain of its constituents, and thus modifying the character of nutriment available for the tree ; but this possibility has been excluded by some experiments in which trees were grown in pots of earth, with trays containing growing grass resting on the surface : the trays were perforated, but the roots of the grass were prevented from penetrating through the holes by a layer of fine gauze ; thus, if the grass still had an action on the tree it could not be due to anything being extracted by the grass from the soil in which the tree was growing, but must be due to what passed down from the grass to the tree in the water applied in watering the grass. That there was such an action was undoubted : taking the three years' results over which these experiments extended, the average vigour of the trees with the trays of grass above them was only 73 per cent. of that of similar trees with similar trays of earth without grass ; and the effect of the grass in the trays was not much less than that in cases where it was grown above tree-roots with no trays ; thus, where there was a sheet of gauze separating the grass-roots from the tree-roots the vigour of the trees was 71 per cent. of that of those without grass, and where there was neither trays nor gauze it was 60 per cent. It may further be added that the effect of the grass in these experiments was approximately the same whether the pots and trays both contained earth, or both sand ; also that no certain difference was observed whether the trays contained grass germinating *in situ*, or grass which had been germinated some time before the trays were placed over the tree-roots.

In these experiments the leachings from the grass would reach the tree-roots in a very few minutes, but in two other sets of experiments the grass was grown in trays away from the trees, and the leachings were not applied to the latter till after they had been exposed to the air for an hour or two, an opportunity having thus been afforded for the oxidation of any toxin in them ; here the results were the reverse of those in the former case, for the trees were benefited by the leachings to the extent of 30 to 40 per cent. in the two series.

The conclusion from this is obvious ; the effect of the toxin formed by the grass is eventually overpowered by the beneficial effect of some other substance formed, which other substance is, doubtless, as in the case of heated soils merely the oxidation product of the previously formed toxin itself. This is in harmony with the observations recorded above that the leachings of growing grass, if oxidised, are beneficial, not toxic, and that the soil removed from grassed ground is more favourable of the growth of trees than that from similar tilled ground.

Recovery from the toxic effect may not always occur, for this effect may have been so great that the plant is permanently injured. This was apparently the case with the tobacco plant under clover. With hard-wooded plants, also, recovery is improbable, for a sever check to growth during their early years leads to permanent stunting, from which, as is well known, they rarely recover. This is why no instances of recovery from the grass effect have been noticed under ordinary circumstances with fruit trees at the farm. But it explains the recovery which is being noticed there in one exceptional case where the grassing occurred gradually throughout several years, and where the check to growth was much less than in the other cases where the ground was grassed at once,

The present explanation of the grass effect is quite in harmony with the great variations exhibited under different conditions. The toxic action will be increased where the grasses are of the stronger growing class, as has been found to be the case, and will be less effective on the stronger growing varieties of trees, which has also been found to be the case at Woburn. It must necessarily vary with the character of the soil: if this is rich, or of great depth, or if it favours the oxidation of the toxin, this latter will be less injurious: at the Woburn farm the soil is shallow, not very rich, and very difficult to aerate consequently the toxic action is great: at Long Ashton the reverse conditions obtain, and the toxic action is small. In the only case where we have noticed no toxic action (at Harpenden, *Thirteenth Report, p.4*) the soil is very rich, being old garden soil. Even at Ridgmont, manure lessens the toxic action, though it does not by any means do away with it (*loc. cit.*—'71). In the pot experiments with tobacco, it may be objected, no connection between the extent of the toxic action and the richness of the soil was noticed, but in that case ample food material for the growth of the plants was added in all instances.

In short, all the observations made at Woburn during the last eighteen years are in harmony with the explanation of the grass-effect now given.

The experiments on the effect of a crop on itself have not yet been extended so as to show whether recovery will eventually take place in such cases also. No doubt it often will, but seeing that the toxic effect is greater than where the plants are different, it will be slower and may not always occur. It is a well-known fact that with agricultural crops, especially when arranged in well-defined plots, the plants in the centre of a plot are at first less vigorous than those in the outside rows, and this may be atributed to the toxic action of the neighbouring plants being only half as great in the outside rows as in the centre of the plot: but this is noticeable only in the early stages of growth; when the crops are mature such differences seem to disappear (though exact observations on this point are wanting), the toxic effect possibly having given place to the beneficial effect of the oxidised toxin.—*Journal of Agricultural Science.*

Straits Settlements.

Rubber Exports during August, 1914.—The following figures of the exports of cultivated rubber from the Straits Settlements during the month of August, 1914, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for August 1913 being added for the purpose of comparison.

	1913.	1914.
	Tons.	Tons.
August	1,315	1,325
January-August	7,248	11,415

The figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements, such as Borneo, Java, Sumatra and Non-Federated Malay States, but do not include rubber exports from the Federated Malay States.—*Board of Trade Journal.*

CORRESPONDENCE.

Liddelsdale Estate,
Naduvatam, 19--10—14.

Tea.

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—As I am sending 500 lbs. tea to the Russian troops at the front, I have been in communication with the Imperial Russian Consul in Colombo and send you a copy of his letter for the information of others who may desire to send some too. I understand the South Indian Railway will carry the tea free of freight to Colombo. Kindly publish these letters in your next issue.

Yours faithfully,

W. B. deCOURCY.

(COPY.)

Imperial Russian Vice-Consulate.
Colombo.

Dear Sir,—I have to acknowledge receipt of your letter of the 13th for which I thank you.

The Ceylon Planters' Association some time ago decided to forward a consignment of tea to the troops in the front and they have allotted 30.000 lbs. to the Russian Red Cross Society. This will be carried by the Russian Volunteer Fleet free of freight and I presume the Russian Government will pass it without any duty. I appreciate much the sentiments in your letter and shall be happy to lend my co-operation to forward the 500 lbs. of tea you so very kindly offer to the Russian troops at the front. If you can arrange the tea to be sent here with instructions to be sent alongside the steamer when necessary, I shall see same is taken on board free of all expenses from the time packages leave the barge. The steamer which will carry this will be advised you later, no sooner her movements are known.

I am, dear Sir,
Your obedient Servant,

(Signed) A. KADNUTZEFF,
V-Consul for Russia.

A Correspondent, well-known as a Director of several Rubber Companies, writes as follows to a Home Contemporary :—

"Are Plantation Companies wise in now making forward contracts at current prices for delivery of rubber during 1915? I am of the opinion that the usages of rubber in modern warfare are so colossal—I can use no other word—that when the war is ended, there may well be a considerable shortage of rubber. I am for the above and other obvious reasons strongly opposed to the principle of plantation companies now selling forward for 1915. I think they will get much better prices for spot in the near future." —*Greniers Rubber News.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Department contributes an article on oil cake for Fertilising purposes with the analyses and prices of three samples, and though necessity has forced on all planters reduction of expenditure to the lowest possible limits, such money as can be spared should go in manures to keep estates up to the mark, so as to be in a position to take advantage of the good time coming in the future. Mr. Anstead also deals with substitutes for acetic acid for coagulation purposes and gives some interesting notes from a correspondent's experience with coagulants, and also deals with spot disease of coffee berries in reply to a query put by a correspondent.

The report of the Nilgiri Planters' Association held on the 12th instant is published.

It will be noted that gifts of produce should be sent direct to the Officers in charge of Supplies, Bombay. Labels can be procured from the Honorary Secretary, Madras War Fund, Madras, which enable the gifts to be sent free by rail.

The Labour Department sends for publication an extract from the *Madras Mail* dealing with the rise in prices and coolies wages and the Government's comment on the Commission's finding. Also a table of statistics regarding Tamil coolies in Ceylon.

From *Tropical Life* we extract an article dealing with the question of manure supplies, especially in regard to potash. The value of nitrate of soda in setting free a large amount of potash, is commented on; and in connection with the same subject we reproduce an article from the *Gardeners' Chronicle.*

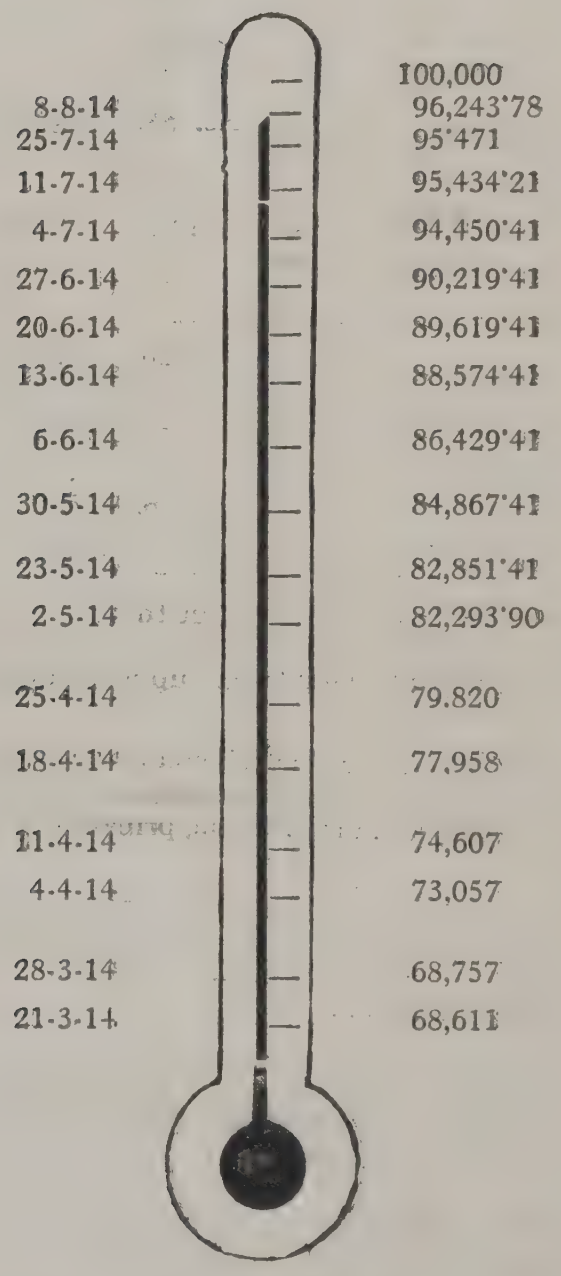
We publish a circular that has been sent us by a correspondent, emanating from the Rubber Growers' Association, and an article entitled Cargo Insurances under War Risks.

Messrs. Volkart Brothers have written us a long letter, the contents of which, in justice to them, should be widely known amongst planters who have long been their constituents; and in all good faith we give publicity to their contradiction of amorphous rumours.

BAROMETER

OF

Labour Department.



The Labour Department of the U. P. A. S. I. started on July 1st, 1914.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Oil Cakes for Fertilising Purposes.

Samples of Oil Cakes now available in Bangalore have been received and analysed with the following result :—

	Ground Nut Cake.	Hongay Cake.	Black Castor Cake.
Price per ton.	Rs. 58.	Rs. 30.	Rs. 45.
*Organic Matter	91·21	96·31	94·43
Soluble Ash	7·67	3·13	4·36
Insoluble matter	1·12	0·56	1·21
	100·00	100·00	100·00
*Containing Nitrogen	5·17	3·63	3·91
	as. p.	as. p.	as. p.
Cost of one pound of Nitrogen ...	8 0	5 11	8 2

All these samples are reasonably clean but the Ground Nut has a most disappointing Nitrogen content while the Black Castor is also below the average. The Hongay is good being quite up to average and at the price quoted it is a very cheap fertiliser.

If we take the figures quoted by Mr. Harrison, the Madras Government Agricultural Chemist, in his *Note on the Indigenous Manures of South India*, published in 1912 we find the following prices per pound of Nitrogen to be the average.

	as. p.
In Ground Nut Cake	7 7
In Hongay Cake	8 11
In Black Castor Cake	9 4

Again if we take the average prices ruling at the beginning of the year, before the War broke out, for Poonacs we find the following prices per pound of Nitrogen :—

	as. p.
In Ground Nut Poonac	7 7
In Hongay Poonac	7 10
In Black Castor Poonac	10 0

Planters in need of Oil Cake will be able to judge from these figures in how far these Cakes now available in Bangalore are worth buying. The cost of crushing and transport to the estate must be added to the prices quoted. How much the War has affected the price of Oil Cake and Poonac I have not been able to ascertain, but on the prices ruling before the War it

is obvious that the Hongay and Black Castor are well worth buying being cheap forms of fertiliser where crushing facilities are at hand. The Ground Nut Cake is not so advantageous, but for estates near Bangalore it may be profitable when transport from longer distances are taken into account.

I shall be glad to hear from any planters who are desirous of purchasing any of these fertilisers and I will put buyers into communication with the seller.

Substitutes for Acetic Acid for Coagulation Purposes.

With reference to the article produced on page 628 of the *Chronicle* dealing with this subject Messrs. Parry & Co. of Madras write me that they note that there may be a possibility of using Sulphuric Acid as a coagulant and they remind me that they are manufacturers of this acid. They would probably be prepared to issue a guarantee as to the purity of their acid from metals and metallic salts were this asked for. They state that the acid is packed in stone-ware jars and wooden cases: each jar contains 42 lbs. of acid and two jars are packed in each case. The price is one anna nine pies per lb. f. o. r. Ranipet, packing charges extra.

This acid is fully concentrated, and herein lies one of the chief objections to Sulphuric Acid as a coagulant. It is difficult and dangerous stuff to handle and dilute in large quantities. However, should other coagulants fail the information here noted may prove useful and it is therefore recorded.

A correspondent sends me some interesting notes of his experience with different coagulants for Ceará latex. Probably much the same results would be obtained with Hevea latex.

Of all the coagulants he has used he prefers Formic Acid or Formalin as giving the least trouble and the best results, but as was pointed out in the Rubber Growers' Association Report the same difficulty arises with Formic Acid as in the case of Acetic Acid, supplies are short and the price has increased.

Sulphuric Acid he finds all right but not an easy coagulant to mix or handle. Tannic acid he finds useless.

Among salts he reports Barium Sulphate is unsatisfactory: Sodium sulphate rather too erratic; and Potassium sulphate also unsatisfactory.

The best results were obtained with Aluminium Sulphate (Alum) and Ammonium Sulphate. The former is difficult to dissolve and slow in action, but it gives a wet rubber which is strong, and velvety in appearance. The strength recommended is ¾ dr. in 60 oz. water to 36 oz. of latex. Sulphate of Ammonia he finds the best of all this class of coagulants. He makes a stock solution of 2 oz. of Sulphate in 16 oz. water and dilutes 1½ drs. of this with 50 oz. of water for 40 oz. of latex.

I hope other planters will let me have the results of their experience with coagulants other than Acetic Acid for publication in these columns.

Spot Disease of Coffee Berries.

About this time of year it often happens that some of the green Coffee berries develop a kind of blotch as if they had been bitten by some insect. These berries rapidly assume the colour of ripeness and later turn black and often fall off. If they ripen, the pulp is found to adhere to the bean at the spot.

The cause of this has not been satisfactorily explained. It is possible that the attack starts by the berries being punctured by an insect, either *Antestia cruciata*, or possibly, *Bagrada picta*. The final cause of the damage, however, appears to be a fungus, which is quite capable of attacking healthy berries without any previous injury to them being caused. Dr. Butler, the Imperial Mycologist at Pusa was good enough to examine and report upon some of these affected berries in 1911. He reported that he found the berles, "to be attacked by a fungus which occurs in the spots on them and which when ripe causes a hairy appearance. This fungus is known as *Colleotrichum coffeanum* previously found in Brazil, and also collected by me some years ago in the Wynaad, Tellicherry, and the Nilgiris. It usally occurs on the leaves forming small brown sharply defined spots."

The only remedy that has been suggested is to pick off and burn all the affected berries at the beginning of the attack with the idea of preventing its spread. The disease needs more study in the field and is one of the many pieces of work awaiting the Mycologist when the U. P. A. S. I. obtain one.

RUDOLPH D. ANSTEAD,
Planting Expert.

Rubber.

As regards London, the market after we went to press last month rallied somewhat, and Messrs. S. Figgis and Co. report that a large business was done on the spot in Plantation rubber, closing with sales of Standard Crepe at 2s. 5*d*., and smoked ribbed sheets at 2s. 5½*d*., with September delivery at 2s. 4*d*., and Hard Fine also dearer: spot value about 3s. 1*d*., but only small transactions taking place. Soft Fine varied between 2s. 4*d*. and 2s. 5*d*., Scrappy Manaos Negroheads at 1s. 9*d*., and Caucho Ball, upriver, f. s. q., 1s. 9*d*. The demand for good Eastern Plantation continued with rather higher prices into September, and although supplies arrived freely very large sales were made towards the end of August at advancing prices, but as is only natural, part of this advance has been lost. The "forward" market, however, was at a standstill. Owing presumably, to the sales of fine lots, at the only auctions held, *viz*., on August 28th, there was practically no good quality catalogued, only browns and specky for the most part being offered, and these had all along been difficult to sell. Out of 310 tons Malaya and 78 tons Ceylon offered at the August public sales, only about 25 per cent., we heard, were sold. Any rate of the commoner grades, prices ranging from 1s. 7½*d*. to 1s. 10*d*. per lb., against 2s. 1½*d*. to 2s. 2½*d*. for standard crêpe and ribbed smoked sheet, and 2s. 11*d*. to 3s. for Hard Fine. This week (September 11th), report Messrs. Figgis, finds the demand for Eastern plantation rubber rather quieter with prices lower at about the following: Standard Crêpe, 2s. 1*d*. per lb.: Standard Crêpe, October—December, 2s. 0½*d*. per lb.: Ribbed Smoked Sheets, 2s. 2½*d*. to 2s. 3*d*. per lb.: Hard Fine Pará, spot, 2s. 9*d* per lb.: Soft Fine Pará, 2s. 1½*d*. to 2s. 2*d*.: Scrappy Negroheads, 1s. 8*d*. to 1s. 8½*d*. per lb.: Caucho Ball, 1s. 7½*d*. per lb.

No auctions have been held since the one on August 26th, and it is uncertain when the next will take place, there are none advertised for September 22nd.—*Tropical Life.*

DISTRICT PLANTERS' ASSOCIATIONS.

Nilgiri Planters' Association.

A Meeting of the above Association was held in the Collector's Office, at 11-45 a.m., on Monday, the 12th October, 1914.

PEESENT.—Messrs. A. R. Pigott, H. E. H. Sladen, W. Rowson, L. L. Porter, G. W, Fulcher, R. Stanes, W. B. de Courcy, J. B. Tothill, A. Dandison, C. H. Brock, J. S. Nicolls, and G. W. Church, (Honorary Secretary).

129. Proceedings of last meeting were read and confirmed.

130. *Devamalla Reserve Forest.*—Read correspondence between Honorary Secretary and Collector and the Board of Revenue.—Recorded.

131. *War Fund.*—The Honorary Secretary announced the Subscriptions which amount to Rs.1,538.

Mr. Brock proposed and Mr. Porter seconded that all the funds collected should be sent to the Indian Imperial Relief Fund.– Carried unanimously.

132. *Gifts of Produce.*—The Honorary Secretary announced the following quantities of Tea and Coffee subscribed, *viz.*, 8,250 lbs. Tea and 1,616 lbs. of Coffee.

Read correspondence between the Honorary Secretary and the Military Secretary to H. E. the Governor of Madras. The letter advises the tea to be sent direct by the donors to the Officer in charge of Supplies, Bombay.

Read letter from the Traffic Manager, South Indian Railway stating that the Tea will be carried over the South Indian Railway free of charge, and the Honorary Secretary was instructed to ask the Traffic Managers of the other Railways to grant similar concessions.

Donors are requested to send the Tea forward, freight to pay, as above, and if there is any freight to be paid it will be adjusted by the Honorary Secretary with the donors.

133. *Tea Freights.*—The Chairman announced the action of the Wynaad Planters' Association. Read correspondence between the Honorary Secretary of that Association and the I. T. A.

The Honorary Secretary was instructed to ask the U. P. A. S. I. to communicate with the Chambers of Commerce of Madras and Calicut with a view to endeavouring to get the Steamship Companies to reduce the extra freight now being charged, which are considered excessive, and are liable to reduce the shipping of produce from India to a great extent.

134. Read letter from Mr. de Courcy *re* demurrage charges at Ootacamund and correspondence between the Honorary Secretary and the Traffic Manager of the South Indian Railway. The matter being *sub judice* it was held over pending a definite reply from the Traffic Manager, S. I. R.

135. Read U. P. A. S. I. Circular from the Chairman with reference to the Scientific Department.—Recorded.

A vote of thanks to the Collector for the loan of the room was passed and with a vote of thanks to the Chairman the meeting concluded.

Mr. H. E. H. Sladen was elected as a new member.

(Signed) J. S. NICOLLS,
Chairman.

(„) G. W. CHURCH,
Honorary Secretary.

LABOUR DEPARTMENT.

The Government of India realizing the serious rise in prices all over India, appointed a Commission of enquiry on the subject to try and ascertain the reason.

The following is the comment of Government on the finding of the Commission so far as the rise in wages of coolies is concerned:—

The most important section of the community are the cultivators who comprise, according to the Census of 1911, more than half the total population. As a rule cultivators grow their own food and to ascertain, therefore, the changes in their real income resulting from the rise in prices, a comparison has to be made between their expenditure as measured by their payments for rents, or land revenue wages, and the commodities purchased and the conclusion to be drawn from this comparison is unmistakable Wages have risen more rapidly even than prices, but on the balance the gain in real income is manifest.

Much the same applies to labour. The increasing profits of agriculture have enhanced the demand for labour on the land, the demand for labour on public works, the expansion of the factory industry and in parts the mortality from plague have combined to promote a great and rapid increase in wages during recent years. When every allowance has been made for the disturbing factors and the rise in prices, Mr. Datta's estimate of an increase of 36 per cent. in real income in 1912 as compared with the basic period 1890-1894 seems fully justified. Equally, or little less, remarkable has been the rise in the real earnings of general labourers and artisans in villages, the urban area and in the cities.—*Madras Mail*

Tamil Coolies in Ceylon.

For the quarter ended June, 1914, statistics show that in every one of the thirteen places mentioned except four, the number of deaths is greater than the number of births.

Place.	Immigrants. (both sexes)	Births.	Deaths.
Colombo	10,236	100	112
Kalutara	33,380	342	368
Matale	27,972	264	312
Galle	6,032	40	45
Kurunegala	8,095	59	125
Chilaw	1,056	6	10
Ratnapura	32,365	340	449
Kegala	64,049	747	768
Kandy	131,840	1,792	1,217
Nuwara Eliya	87,599	1,165	827
Matara	3,062	38	30
Badulla	64,235	691	557
Totals...	469,921	5,584	4.820

Naturally Kandy and Nuwara Eliya are the most popular places.—*Times of Ceylon.*

The crisis in the Brazilian coffee trade has increased owing to the closing of the European market. The Government is contemplating measures for the protection of the trade. There are rumours that Germany is negotiating for the purchase of 3,200,000 sacks of coffee at the current value on the Hamburg market.—*Capital*

THE QUESTION OF MANURE SUPPLIES.

We have had a large number of inquiries from firms this side of the water *re* the output of potash, nitrate of soda and other manures, the writers wishing to know :—

(1) Can we get supplies from the local agents near our estates ?

(2) Will futher shipments go out from the mines ?

(3) Will prices be changed to any important extent ?

In reply to the above we have written to the agents abroad to ascertain what supply they have, and how long these will hold out. Of potash we can give no news, except that no supplies can be obtained from the mines until the conclusion of the war. This, we believe (touching wood to avoid ill-luck befalling the Allies for saying so), cannot last very long, but until the mines are working again we can only refer our readers to the advice given further on, as how to make up, by local supplies, the deficiency from the mines in Europe. Regarding nitrate of soda, however, there is no shortage at any of the depôts, and those likely to need supplies in the near future would be wise to place their orders freely at once before hostilities cease, for directly the war is over the demand from Europe alone to make up for lost time will be enormous. Should the war last only another three months even, it will be at least as long again before orders will be given out, and then from 500,000 to perhaps 750,000 tons may be bespoken for European use, with the result that prices during the rush must increase, as has been the case with potash where sellers have got caught without supplies. By the time our October number is out we shall have heard from the various depôts and agents overseas, and can then inform planters where and to what extent, they can rely for supplies of potash, and the price it is likely to cost. Two of the potash mines are in Alsatia, but whether supplies can be obtained from them sooner than from the chief centres in Germany remains to be seen. It is certainly important for planters that supplies should be got out as soon as possible, and we feel sure that the Allies will do all they can to help the planters in the Tropics who have rallied so splendidly to help them.

Meanwhile we noted with interest, a little time back, the issue, for the eleventh year, of Mr. Brodie James' interesting booklet, "Nitrate Facts and Figures." This contains the usual interesting matter for shareholders and others interested in Chilean nitrate of soda, whilst two new items are added, *viz.*, the average price of nitrate f.o.b. Chili for the past seven years, and the highest and lowest quotations and dividends of the English companies for the past six years. In his preface Mr. James states that the recent Restriction or Production did not produce the result anticipated, and is not likely to be repeated. We presume that the result anticipated was a reduced output, and it seems evident that if nothing had been done there would have been an increase equal to the amount restricted, say, 2,000,000 quintals, more or less. As to the likelihood of a repetition of the restriction the present state, not only of Europe, but of the whole nitrate-buying world renders one unable to offer any opinion. The enormous requirements that Europe alone needs, being completely checked, *pro tem.*, will of itself greatly restrict the output from the mines so we must now sit up and wait for peace to see what orders are sent over the wires directly the armies are broken up and the merchant, the land-owner, and the tiller of the soil return to their work.

Discussing nitrates reminds us that those who are suffering from a curtailment of their supplies of potash, the absence of which is likely to continue for some little time, will do well to remember the great part that the soda content of nitrate of soda plays in freeing the potash in the soil, and making it available for absorption by the growing crops. Various papers interesting in agriculture have been calling attention to this, and directly the trouble started on the Continent the Board of Agriculture, now one of the most wide-awake of our departments, called the attention of agriculturists to the experiments carried out at Rothamsted and elsewhere which proved that soda has the power of liberating potash in the manner described; and with mangolds and barley the beneficial action arising from the use of soda has been most marked. We believe it was Dr. Russell who, in his book on "Fertilisers and Manures," told us that "for twenty-five years the use of nitrate of soda alone has enabled the soil to supply a mangold crop with the large amount of potash it needs." Since this is so, the amount of nitrate of soda applied to areas under crops in the Tropics will undoubtedly be increased, and those have not yet made use of this means of increasing their supply of available potash in the soil will do well to do so. Meanwhile, of course, the ash of any rubbish that is burnt, as on coconut, cacao and other estates, must be preserved for use as occasion demands, and not merely left on the ground as is generally done. Now-a-days all wise planters "clear up" and burn regularly once a week, if not oftener, and those doing so will find that quite an important quantity of ash can be collected for mixing with other fertilising material. Those who cut down or grub up their cotton plants to avoid the carrying over of pests, who cut out prickly pear and other prescribed weeds, or who heavily prune their tea plants, will certainly be able to secure a considerable quantity of ash that will be quite valuable in these days.—*Tropical Life.*

Rubber Manufactories and the War.

Reports from the manufacturing districts in the north of Great Britain by last mail refer to unprecedented activity in waterproof sheeting and other items of military equipment, both on account of our own Army and those of Russia and France. It is further stated that numerous manufacturers are now reaping the benefit of the cessation of German trade, particularly in respect of electrical fitments. To some extent, therefore, increased activity at home and in America will counterbalance the enforced inaction on the Continent.—*The Ceylon Observer.*

India Tea campaigning in U. S. A.

Mr. R. Blechynden, representative of the Indian Tea Cess Committee in the United States, in concluding his Report upon the advertising work done in the United States during the first five months April to August of the season 1914-15, writes:—"The financial dead lock will for a time check the importations of all teas, but as stocks are very low and prices are high, I think that we may expect that the movement when it commences will be largely from London, and that there will be a longer check to arrivals from China and Japan. The result may be an excess of India and Ceylon teas at first, and I trust by that time funds may be available to permit of our aiding in moving these teas into consumption and getting them established, so that they will be able to hold their own when other teas come along."—*The Ceylon Observer.*

POTASH MANURES.

The Board of Agriculture and Fisheries desires to draw the attention of farmers and gardeners to the need for seeking new courses of potash manures. This country's supply of artificial potash manure comes almost entirely from Germany, the existing stock is very small, and no further importation is possible for the present. The chief natural sources of potash immediately available are (1) seaweed, and (2) weeds, prunings, hedge clippings, brushwood, leaves and vegetable refuse generally. Seaweed is already entensively used as a manure on the coasts, All who have access to this source of supply should collect it in quantity. Bread weed may be used direct as manure. Grassy weed and tangle should be dried and burnt wherever possible. A tin of fresh weed should yield 20 to 30 pounds of potash (enough, for example, to manure from a quarter to half an acre of Potatoes). Inland farmers and gardeners may obtain potash by burning all kinds of vegetable refuse not suitable for direct application to the soil. The percentage of potash in vegetation varies very widely. Among ordinary weeds, for example Thistles might yield 5 per cent. and Nettles 2·5 per cent. of their weight; timber contains very little potash, cordwood a considerable quantity, and brushwood still more; ordinary wood ashes might contain from 5 per cent. to 10 per cent according to their source. The natural variations are so great that it is not possible to state definitely the composition of the ashes resulting from the burning of the weeds, prunings, hedge-clippings, etc., but they might be expected to contain from 10 to 15 per cent. of potash, *i.e.*, they might be worth as much as an equal weight of kainit (last spring kainit sold at about £2 10*s.* per ton.) It is absolutely essential, in the absence of full supplies of farmyard manure, that potash should be provided for such farm crops as Potatoes and (on light soils) Turnips, and that it should be available in gardens for Potatoes, Carrots, Parsnips, Onions, and many other crops. In view of the lack of employment for unskilled labour in many districts farmers might well begin by collecting all readily—available vegetable refuse with the view of drying and burning it, and storing the ashes for early spring use before the winter sets in. Similarly during the winter much labour might be employed in rooting out old hedges and clearing off other coarse vegetation in itself objectionable. All these cleanings might be burnt and the ashes used in late spring at a time when potash manures may be of great value. The ashes must be stored in a dry place. The carbonate of potash present in ashes is very soluble, and would quickly be washed out if explosed to rain. The following leaflets dealing with the uses of potash manures may be obtained post free on application to the Secretary. Board of Agriculture and Fisheries. Letters of application need not be stamped. Leaflet 80.—Use of artificial manures. Leaflet 106.—Fertilisers for market garden crops. Leaflet 254.—The use of seaweed as manure.—*The Gardeners' Chronicle.*

Fibre.—Sisal hemp (*Agave rigida sisalana*) and Mauritius hemp (*Fourcroya gigantea*) continue to be cultivated in the vicininy of Lourenco Marques. The most important plantation has 600 acres of *Fourcroya* and 100 acres of sisal producing and the necessary plant for treating the leaves. It is reported that a small sample shimpment of *Fourcroya*, recently sent to London for expert examination, proved very satisfactory. The quality of staple and colour were considered of very high grade, and the various lots were valued at from £31 to £51 10s. per ton.—*Diplomatic & Consular Reports, Portugal.*

RUBBER.

THE RUBBER GROWERS' ASSOCIATION (Incorporated.)

38, Eastcheap,
London, E. C., 8th September, 1914.

Emergency Finance.

Dear Sir(s),—With reference to the circulars dated 10th and 14th ultimo on the subject of temporary financial assistance to Rubber Companies, I am instructed to advise you that in view of apparent doubt existing as to the correct interpretation of the cable from the Officer Administrating the Government of the Straits Settlements to the Secretary of State for the Colonies, the Emergency Finance Committee of this Association approached the Colonial Office in the matter and asked to be informed of the exact conditions under which arrangements were being carried out. The Colonial Office were also asked if the facilities would apply to Rubber Companies operating in the State of Johore.

A reply was received from the Colonial Office to the following effect :—

1. The High Commissioner for the Malay States reports that he has already sanctioned loans amounting to £600,000 in the Federated Malay States and Malacca, the Residents being given discretionary power as to the allotment of the sum, which is all that was asked by the planters' representatives.

2. Advances have been made at 30 cents per lb. or on title, and in some special cases without security on the responsibility of the residents. The amounts lent have been limited to the immediate needs caused by the war and interest at 1% per month is being charged in cases where the loan is not secured by rubber produce.

3. Advances are also being made by the Government of Kedah and Johore where no limit to loans has been fixed.

The Committee on receipt of this communication further addressed the Colonial Office on the following points :—

1. The Committee note that loans, amounting to $600,000 have already been santioned in the Federated Malay States and Malacca, and assume that this amount includes both advances at 30 cents per lb. of rubber and on caveats on titles.

2. The Committee understand that the Eastern Banks are now prepared to advance up to 1 per lb. against shipments of rubber, so that any funds which have been locked up under the advance of 30 cents would now be available for loans against caveats on titles.

3. It would, therefore, appear that the immediate necessity of rubber estates is confined to those not yet producing, or only partly producing, and the Committee hope that in view of the present impossibility of such Estates raising further Capital by the issue of Shares or Debentures, every possible assistance will be given to those who possess sound well-managed properties to maintain them.

4. To enable the Committee to reply to enquiries received at this end, they would like to know whether loans are being made irrespective of whether the Estate is owned locally or elsewhere.

5. The Committee note that, in cases where the loan is not secured by rubber, interest at the rate of 12% per annum is being charged, and they

would respectfully suggest that in view of the circumstances some modification of this very high rate be considered,

To this the Colonial Office replied as follows :—

Copy of letter from the Under Secretary of State for the Colonies to the Secretary of the Rubber Growers' Association under date 4th September, 1914 :—

I am directed by Mr. Secretary Harcourt to acknowledge the receipt of your letter of the 28th ultimo. on the subject of assistance from Government to Rubber Estates in the Malay Peninsula. Mr. Harcourt does not feel able to interfere with the discretion of the local Government in the matter, but a copy of your letter has been sent to the Officer Administrating the Government of the Straits Settlements, and the High Commissioner for the Malay States for consideration. As regards the question raised in the fourth paragraph of your letter, I am to say that Mr. Harcourt has no information to show whether loans are being confined to Companies registered locally or are being extended also to Companies registered in London. The desire of your Association for such an extension was, however, specifically mentioned in the telegrams referred to in the first paragraph of the letter from this Department of the 13th August.

Yours faithfully,

FRANK G. SMITH,
Secretary.

N. B.—The above information is being circulated to the Press.

INTERNATIONAL COMMISSION ON THE CHEMICAL ANALYSIS OF SOILS.

According to *Nature* for August 6, 1914, a meeting of the International Commission on the Chemical Analysis of Soils was held at the Forestry Research Station, Munich, on April 23-4.

The first discussion centred round the relative merits of Hilgard's method, and the members finally decided to unite in their efforts to obtain a standard method, and to investigate thoroughly the different methods side by side for their particular types of soil. Great interest was shown in the discussion on the estimation of the easily soluble soil constituents. The remarkable part about this discussion was that no method involving the use of organic acids such as citric acid was even mentioned. The methods of Hall and Dyer, and the American official method, used almost exclusively in England and America, respectively, appeared to be very little employed on the Continent. It was unanimously decided for the purposes of the Commission, members for the present should confine their work of extraction with water and CO_2.

At the meetings in the laboratory a large collection of soils of Bavaria and other German States, as well as from the colony of Togoland, were shown to the visitors.—*The Agricultural News.*

A note in the *Gardeners' Chronicle* for July 11, 1914, states that pollen can be preserved by cold storage, and that it keeps best if it be protected from an excess of moisture. For preserving pollen for hybridization purposes, the following procedure is recommended. In a small cylindrical glass tube place a few grains of dry calcium chloride, and cover with a thick wad of cotton wool. Put the ripe pollen in a small thimble made of flexible cardboard. Cork the tube and keep it in a cool place—if possible in cold storage.

CARGO.

Cargo Insurances under War Risks.

An explanatory memorandum on cargo insurances, as revised on Tuesday, has been issued by the War Risks Insurance Office. It is pointed out that cargo only is insured under King's enemy war risks. The insurance is undertaken subject more particularly to the following conditions: –

(*a*) That any cargo may be insured which is not enemy property, or goods the transport of which is prohibited by proclamation or otherwise restricted;

(b) That the cargo is carried on a British steamer which is entered in one of the undermentioned War Risks Associations approved by the Government, and that a war risks policy has been taken out on the vessel covering the voyage in question under the Government scheme for the reinsurance of hulls; and

(*c*) That the voyage is not one which is prohibited by the Admiralty.

The approved War Risks Associations are:—The North of England Protecting and Indemnity Association, Collingwood Buildings. Newcastle-on-Tyne; the Liverpool and London War Risks Insurance Association, Limited, 10, Water Street, Liverpool; and the London Group of War Risks Associations, 24, St. Mary Axe.

As a general rule, cargo carried on a vessel which has already sailed cannot be insured under the Government scheme, but the War Risks Insurance Office is, notwithstanding, authorised to consider applications for the insurance of cargo on a vessel which has already sailed, or can be warranted safe at a port of call or at some point on her voyage.

The premium is charged at a flat rate irrespective of the voyage or of the character of the cargo insured. All applications for cancellation or return of premiums must be accompained by a statement of reasons and supporting evidence, together with the stamped slip and policy. In the case of claim for partial cancellation the marine policy should be produced. Where the application for cancellation or return is consequent on war risk insurance previously effected elsewhere, the slip and policy relating to the other insurance must be produced.

Cargo insured against King's enemy war risks under the Government scheme must be covered by approved marine insurance policies as already defined.

Applicants desiring to retain at their own risk a portion of the war risk, insuring the remainder under the Government scheme, may so retain up to but not exceeding 50 per cent. of the declared value, but with the reservation that whatever be the proportion so retained at the inception of the risk it shall be retained at the risk of the assured until its termination. In such cases the total value of the interest at risk must be declared on the application slip for insertion in the policy. The foregoing does not preclude the assured from insuring with approved underwriters or insurance companies any portion of the war risk not placed with the War Risks Insurance Office, provided that such insurance be effected not later than the insurance with the War Risks Insurance Office. The value for the purpose of insurance against war risks must not exceed the value for insurance against sea risks. The premium in force at the time the insurance was effected cannot,

unless in the case provided for in Clause 1 of the policy, be afterwards reduced or increased. Payment of admitted claims will be made promptly by cheque on the Bank of England.

A White Paper issued on Monday evening contained the Report of the Sub-Committee of Imperial Defence recently appointed to report on insurance of ships and cargoes in time of war. The decision of the Government was announced on Tuesday in the House of Commons. The proposal, so far as concerns the insurance of hulls, is that it will be worked in conjunction with the Clubs which now cover war risks on a mutual basis. The cover given by these Associations protects the shipowner when this country is neutral or, if it is a belligerent, until the ship can reach the nearest safe port. The effect of the Government proposal is to carry on the risk by offering to re-insure 80 per cent. of the value for the new voyages at a premium to be fixed by the Government, which will not be less than 1 per cent. nor more than 5 per cent. according to the risk of the particular voyage. In the case of cargo there is no machinery available to take up the insurance of risks which attached before the outbreak of war, and therefore the Government's scheme limits itself to insurance on cargoes for new voyages begun after the outbreak of war. The rate charges will naturally vary according to the conditions and the risks of the venture, but it is stated that the maximum premium will be 5 per cent. The whole of the risk will be assumed by the Government as against the risk of 80 per cent. in the case of hulls. There is no doubt that the experts who drew up the Report had given the question very careful attention, and the scheme proposed is likely to be of great value to shipowners and shippers, apart from its effect on the country at large. Shipowners will be able to run their vessels with confidence that they are covered by insurance, while shippers can secure cover for any cargo that they may wish to ship.—*Fairplay.*

STRAITS SETTLEMENTS.

Rubber Exports during August, 1914.

The following figures of the exports of cultivated rubber from the Straits Settlements during the month of August, 1914, are from telegraphic information received by the Malay States Information Agency in London, the corresponding figures for August, 1913, being added for purposes of comparison :—

	1913.	1914.
	Tons.	Tons.
August ...	1,315	1,325
January—August ...	7,248	11,415

These figures include transhipments of rubber from various places in the neighbourhood of the Straits Settlements; such as Borneo, Java, Sumatra, and the Non-Federated Malay States, but do not include rubber exports from the Federated Malay States.—*The Board of Trade Journal.*

The world's record for the output of sugar for any one factory is held by Chaparra in Cuba which has brought its 1913-14 crop to a close with a production of slightly above 611,000 bags, or 87,300 long tons of sugar, polarising very close to 96. The *Louisiana Planter* (August 1st, 1914) says that this will most likely stand in no grave danger of being passed for some time to come. As a matter of fact the case just quoted is only one of the several records that have been made in Cuba on the 1914 crop.—*The Agricultural News.*

TEA

Calcutta Tea Sales.

BROKERS' SALE REPORTS.

Messrs. J. Thomas & Co.

In their Price Current for the period from 8th to 21st October, 1914, write:—

Since our last fortnightly report two small sales have been held, the first a private one of 15,000 packages and the second a public one of the same quantity. There was a fair demand at both sales, but especially at the Public Auction of 20th instant, where there were evidences of a gradually widening enquiry, although it is doubtful if the Trade can yet handle any large increase in the present offerings. For next week 17,500 packages will be offered.

Common leaf has been in request during the fortnight, and all teas up to As. 6 close with a hardening tendency. There was a little more enquiry for Pekoes, while a fair number of Dusts were bought for Handow up to As. 5/6 per lb.

The difficulties of finding tonnage for out-markets are still considerable, but the situation is gradually improving.

Quotations:—

Lowest Sound Leaf	...5 7	20th October, 1914.
Ordinary Common Pekoe Souchong	...5 3	
Ordinary Common Pekoe	...6 0	
Lowest Sound Leaf	...6 2	21st October, 1913.
Ordinary Common Pekoe Souchong	...6 7	
Ordinary Common Pekoe	...6 10	

EXPORTS OF INDIAN TEA FROM 1ST APRIL, 1914, TO 21ST OCTOBER, 1914.

	Season 1914-1915. lbs.	Season 1913-1914. lbs.	Season 1912-1913. lbs.
United Kingdom, including shipments *via* Chittagong...	121,952,852	124,300,341	122,861,704
Australian Colonies ...	6,434,441	5,840,494	5,918,739
America ...	4,086,497	4,121,164	4,657,351
Russia ...	8,343,550	23,535,489	20,366,680
Bombay and Persia ...	3,106,365	2,861,492	4,904,180
Sundry Ports ...	2,656,023	3,325,421	3,718,812
Total ...	146,579,728	163,984,401	162,427,466

EXPORTS FROM SOUTH INDIA FROM 1ST APRIL, TO END OF SEPTEMBER, 1914.

United Kingdom ...	4,943,998	4,645,720	4,803,862
Colombo ...	1,268,924	1,448,859	1,989,947
Foreign Markets ...	2,483,295	2,457,585	3,036,665
Total ...	8,696,217	8,552,164	9,830,474

Shipments of Green Tea are included in the totals.—*Indian Planters' Gazette & Sporting News*.

COFFEE.

Coffee in Tonking.

BOREL, M. in Bulletin Economique de l' Indochine, Year XVII, No. 106, pp 54-60. Hanoi, January-February, 1914.

The coffee bush is little pruned in Tonking owing to the borer (*Xylotrechus quadrupes*,) which causes so much damage on plantations that planters allow suckers to grow in order to furnish a substitute for the parent bush when the latter is attacked by the beetle. On the other hand the bushes are kept low by being topped as soon as they are one year old in order to develop the lower branches and expose the young plant less to the action of the wind. Usually the trunk is not allowed to grow above 5 ft. making with the uppermost branches a total height of 6 to 6½ ft., which could not be increased without letting some of the fruit get out of reach of the pickers.

Manurial requirements per bush are: 55 lbs. of dung every two years; ¾ oz. of nitrogen, 1 oz. phosphoric acid and 2½ oz. of potash every year; and every three years a dressing of lime varying in amount with the nature of the soil.

The yield per bush varies from ½ lb. to 2 lbs. of coffee, with an average of about 1 lb. Approximate estimates of expenses and returns on coffee plantations are as follows:

A.—Plantation of 50,000 *bushes.*

	£.
Total cost of establishing plantation spread over 4 years ...	4,310
Expenses during 5th year	1,188
Sales during 5th year—	
44,000 lbs. of coffee	1,804
Live stock run on the plantation	225
Total Sales ...	£2,029
Total profit	841
Less 15 per cent. to Manager	126
Net returns ...	£715

or a return of 15·6 per cent. on a capital of £4,310 over and above a 5 per cent. interest on capital allowed for in estimated expenses.

B.—Plantation of 160,000 *bushes*

	£.
Total cost of establishing plantation spread over 4 years ...	10,512
5th year:	
Expenses estimated to counterbalance one another ...	3,267
Receipts	3,310
6th year:	
Expenses	3,375
Receipts	6,505
Total profits	£3,130
Less 1 per cent. to Manager	470
Net returns ...	£2,660

or a return of 25·3 per cent. on a capital £10,512 over and above a 5 per cent. interest on capital allowed for in estimated expenses.—*Monthly Bulletin of Agricultural Intelligence and Plant Diseases.*

CORRESPONDENCE.

"Messrs. Volkart Brothers."

THE EDITOR,

Planters' Chronicle,

Bangalore.

Sir,—Competition in trade does sometimes engender commercial jealousy, and while constitutional means of acquiring business is permissible, the machinations of ill-informed persons in attempting to decry the well-known and well-established Firm of Messrs. Volkart Brothers by spreading untrue reports about the constitution of the Firm and referring to it as German in character and origin, are, to say the least of it, unpardonable, and bear evidence of efforts to stifle the Firm's ever increasing commercial prosperity in favour of their detractors, or of those in whose interest they have started on their calumniating propaganda.

Our old constituents and friends know well, and we hereby declare for the information of the general Public, that we are in no sense a German Firm; nor did we ever claim affinity to the Germans. Ours is in origin, essence and character purely and simply a Swiss Firm, not the so-called Swiss with which for purposes of present convenience some people have been lately attempting to claim motherhood, but the genuine stuff, not made in Germany, but wholly and entirely in Switzerland. Our Home offices are and always have been ever since the constitution of the Firm in WINTERTHUR and LONDON; the partners of the Firm and all members of one family born and bred in Winterthur in Switzerland and consequently pure Swiss, whose business is and always has been financed by the members with Swiss capital. Ours is decidedly not a German Firm and is not financed by German capital, nor is the Head office or ever has been in Hamburg as we believe has been attempted to be spread by some apparently ill-designing person or persons.

We should not have considered it necessary to make this public avowal in the light of facts well known to the commercial public for years past but for the fact that it has been brought to our notice that attempts are being made by some person or persons, especially in the planting districts of Mysore, to spread reports that ours is a German firm, thereby to seek to divert our Planter friends and constituents by disseminating the germs of suspicion that they are dealing with Germans or rather with a German Firm.

For the information especially of our planter friends and constituents we consider it necessary to counteract any effect such baseless rumours may have on them, by characterising such reports as wholly untrue.

Our Mysore Agent, Mr. J. G. Hamilton of Chundrapore Estate, an Englishman, who has been appointed by us to the charge of and who will in the course of next month assume management of our Mangalore Coffee curing Works in succession to our late Agent, Mr. Irwin Durham also an Englishman, has known our Firm for years past and is well acquainted with the history and constitution of the Firm, and can personally testify not only to the Swiss character and origin of the Firm but also to the fact that our offices in Southern India with which our Wynaad, Nilgiris, Shevaroys, Mysore and Coorg Planter friends do business, *viz.*, Calicut, Tellicherry and Mangalore are under the management of purely Swiss gentlemen and manned by a staff of senior assistants all purely Swiss, the junior assistants and clerks being Eurasians and natives of India. One Austrian element we had as one of the Senior assistants has lately had to leave the Firm and been interned.

We take this opportunity of warning such person or persons as have allowed their misguided zeal to outrun their discreetnees by disseminating such unfounded reports, that they are treading on dangerous ground and publishing matters which are false and malicious, and that we may have to protect ourselves by adopting the alternative of bringing them to book in the criminal and civil courts if they do not desist from the misguided course reported to have been adopted, as their real object would appear to be to harm the reputation and standing of a well-known and universally respcted Firm.

VOLKART BROTHER
by Agent, Mr. U. Zellweger
of Tellicherry.

26th October, 1914.

A NEW FIBRE DECORTICATOR.

The advantages of a new machine for scutching sisal, flax, hemp, ramie, Hibiscus, jute, banana and other fibres are presented in the *Queensland Agricultural Journal* for July 1914. The machine is known on the market as 'LaFrançaise,' and it is stated that all information may be obtained from Mons. F. Michotte, 45, Avenue Trudaine, Paris.

The advantages claimed for this machine are very briefly as follows: It is adaptable for all sizes of leaves or stems; it can set up to work in the field; it is not complicated in construction nor does it require skilled attention; the work performed is said to be perfect, rapid and economical, the leaves or stalks are treated by direct attack, and the decortication is effected in one passage through the machine; the leaves or stalks have not to pass through the beaters several times as is the case with other machines: and a peculiarity of the machine is that no preliminary hand labour is required to remove the leaves, as is often the case in connexion with ramie. The motor power is economical.

'La Française' will treat about 2,700 lb. of dried leaves or stalks and 5,620 lb. of green in a day of ten hours, producing about 337 lb. of dry fibre. Consequently it is equal to decorticating in five days the crop of $2\frac{1}{2}$ acres of help, representing 27,000 lb. of stalks or leaves. The price of the machine (at the works) complete is £58-10*s*.—*The Agricultural News*.

In an interesting paper in the *Popular Science Monthly* for August Dr. William H. Ross. of the United States Bureau of Soils, deals with the origin of nitrate deposits, more particularly of the famous Chilean beds, which occur in the deserts of Atacama and Tarapaca, and still form the principal source of the world's supply of nitre. In the year 1912, for example, the total quantity exported from Chile was 2,485,860 tons. The origin of these enormous deposits is still uncertain; the various theories which have been put forward to explain their existence are dealt with in some detail in the present paper. It has been suggested that they have been formed by the nitrification of immense deposits of sea-weed, of guano, or of the dung of vicunas and llamas, but it is more probable that they represent the concentrated fertility of the thousands of square miles of land between the watershed of the Andes and Coast Range, the nitrates formed in these regions being washed out by the periodical mountain floods, which occur every seven or eight years, and subsequently recovered by the evaporation of the leachings in the lower levels, where the nitrates are found.—*Nature*.

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

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(INCORPORATED)

Contents.

It will be noticed that the Barometer has been removed from the first page of the *Chronicle*. There have been no additions to the acreage for some time past, but when happier times arrive, the Barometer will be republished.

The Planting Expert publishes an article on Sulphuric Acid for coagulating purposes and gives advice as to its use, and that only by experiment can the strength of the solution be found.

By the courtesy of the Indian Tea Association, we are able to reproduce a very interesting article on Insects by Mr. E. A. Andrews, one of a series which we hope to publish from time to time, and will be found very interesting by all our readers.

From the *India Rubber Journal* we extract an article on Catch Crops and Inter Crops in Rubber, by Mr. Munro, of the F. M. S., prepared for the Batavian Rubber Congress. We are not aware that catch crops are much in vogue on Southern Indian Rubber plantations, but call attention to the last para giving a list of those plants which are stated to have given excellent results as plant food.

The Pruning of Tea, compiled by Dr. G. D. Hope and Mr. Carpenter, is dealt with by R. D. A, who suggests that this monograph should be in the hands of every Tea Planter, and gives some extracts from the authors' preface.

We republish the first portion of the Address on Agriculture by the President of that section at the Australian Meeting of the British Association. As the address has great bearing on all agriculture, it will be continued. The method of reducing and bringing under cultivation old land and making it productive is worth consideration by all planters. The factors that make for successful redemption are rainfall, temperature and texture of the soil.

We are informed that the Cochin Rubber Company, Ltd., was awarded a gold medal for its exhibits at the recent Mysore Industrial Agricultural Exhibition. This is the fifth year in succession that this well-known Company has carried away these trophies. The Manager, Mr. R. de Roos Norman, is to be highly congratulated on this and other successes obtained by him in the Rubber World.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Sulphuric Acid for Coagulation purposes.

It was mentioned in these columns in the issue of 31st October that Sulphuric Acid might be used as a coagulant in place of Acetic Acid should the supplies of this latter acid fail, and that there was a constant supply of Sulphuric Acid as it is manufactured in the Presidency. On my way back from Madras last week Mr. Bernard, Messrs. Parry & Co's Chemist, kindly invited me to visit Ranipet and see the Acid plant there and I took the opportunity of talking to him about the best means of sending Sulphuric Acid to estates and handling it when there. I find that it can be sent just as cheaply in small glass bottles with rubber stoppers as it can in the earthen-ware jars originally mentioned and in this form it will be easier to handle and there will be less danger of its being spilt or the vessels containing it in quantity broken.

The Acid sent will be highly concentrated and care must be taken in diluting it. The Acid must always be poured into the water required for dilution and it should be poured in slowly in a thin stream while the water is kept stirred. When strong sulphuric acid is mixed with water a great deal of heat is produced, but in making dilute solutions such as will probably be used for coagulation purposes the volume of water is so large compared with the acid to be added to it that this factor need not be much considered. Anything up to a 10% solution produces very little heat, it is when 20-30% solutions are required that the matter becomes troublesome owing to the heat developed. The most suitable vessels in which to make the dilute solutions are probably wooden tubs. That a dilute solution can be used I judge from the fact that Parkin in his study of the coagulation of latex found that it required 0·1 gr. of sulphuric acid to coagulate 100 cc of pure latex as compared with 0·95 gr. of acetic acid. The latter acid was chosen as the best coagulant for many reasons, one of which is that it gives a wider range of complete and nearly complete coagulation than any other acid. Thus with sulphuric acid coagulation was not complete with 0·05 per cent. but was about complete with 01—0·2 per cent. while it was not complete with 0·25 per cent. Acetic Acid coagulation on the other hand was complete with between 0·09 and 0·39 per cent. and almost complete with 0·25 to 0·8 per cent. Thus acetic acid may be added in quantities either four times below the proper amount or nine times above with very little waste of rubber, while with sulphuric acid a more exact quantity must be used to ensure the maximum of rubber being coagulated. The reason for this variation in coagulation with too weak or too strong acid is due to the fact that if Hevea latex, which is naturally alkaline, is made neutral or slightly acid by the addition of an acid the rubber separates and forms a coagulum. Parkin considered that coagulation in the case of this latex is brought about by the separation of the protein matter from the solution which entangles in its meshes the rubber particles so as to form a clot. The protein is insoluble in neutral solution but soluble in alkaline or acid media. If therefore too much acid is added then the protein remains still in solution and the coagulation is incomplete.

Before sulphuric acid is adopted as a coagulant a number of experiments must be made on the estate to discover the best strength of solution to use.

RUDOLPH D. ANSTEAD,
Planting Expert.

ON INSECTS

By E. A. Andrews.

Part II.

All insects at some time during their existence undergo metamorphosis, that is to say, change of form. In some cases this metamorphosis is very marked and sudden, whilst in others it is less marked and more gradual. This difference led some authorities to divide insects into two groups, the *Metabola* with marked, or "complete" metamorphosis, and the *Ametabola*, with less marked, or "incomplete" metamorphosis. This division, however, was purely artificial, and has now been dropped, as it is obviously exceedingly difficult, in a series showing metamorphosis in varying degrees, to decide where the one division shall end and the other begin.

The typical life history of an insect is divided into four stages, each stage distinguishable from the other three, both by structural and physiological characters. These four stages are as follows:—

1. The *egg* stage, or period of formation.
2. The *larval* stage, or period of growth.
3. The *nymphal* or *pupal* stage, or period of transformation.
4. The *adult* stage or period of reproduction.

As an illustration of this typical life history let us take that of a butterfly. The insect begins life as an egg. This is a resting stage, but internal changes are going on all the time, which consist in the formation and differentiation of the tissues of the future insect from a mass of protoplasmic substance. No food is absorbed and no outside work is done. The egg contains within itself the matter and vital energy necessary for the change and by means of the latter the former is transformed into a being capable of a free-living existence. When this transformation is completed the insect emerges from the egg a larva (the familiar caterpillar) and enters upon the first active period of its life. During this period food is absorbed, and the tissues formed during the egg stage become enlarged, resulting in growth of the whole insect. The structure of the larva is adapted for one set of functions—those appertaining to growth—and the organs which perform those functions—the digestive organs—are developed to the exclusion of other organs, such as those of reproduction, which have nothing to do with growth. During the larval stage the insect undergoes several moults. Now comes a second resting stage, during which the tissues are broken down and re-arranged. This is the pupal stage. The organs of flight and reproduction are developed, and the insect emerges as a being capable of reproducing its kind, having, during its life, undergone complete metamorphosis.

In other insects, however, the development may not be marked by such well-defined stages as in the case cited above. The larva of the tea mosquito, for example, and of all members of the same group emerges from the egg having very much the same appearance as the adult, save that it is much smaller and wingless. This larva undergoes five moults, and each time it emerges bears a little more resemblance to the adult. Similar changes to those undergone by the caterpillar on becoming a pupa have taken place, but instead of beginning when the end of the larval period was

reached, and growth completed, they have occurred simultaneously with it. Such a life history is typical of an insect with incomplete metamorphosis.

In passing in review the various groups of insects we shall see how the life history of different forms approaches more nearly to one or other of these two types.

Insects are divided into nine large groups, known as Orders, which it is now proposed to discuss in rotation, with particular reference to those of most interest to the tea planter.

The first of these orders is known as the *Aptera* (without wings). As the name implies, the *Aptera* are wingless insects; the mouth may be either mandibulate (adapted for chewing) or suctorial (adapted for sucking); the metamorphosis is very incomplete, there being very little difference in appearance between the young and the adult. These insects are on the whole very primitive, and the best-known member of the order is the common fish insect, or silver-fish, which is found in most bungalows, in the bookcase or behind the pictures on the wall. Other members of the Order are to be found under stones, or among rotting vegetation, and are only to be found by very careful searching. One species lives amongst rock-pools on the coasts of Europe. Very little is known about the order as a whole, and its members are of no importance so far as tea is concerned.

The second Order of insects is the *Orthoptera*. In this group there are two pairs of wings. Those of the first pair are somewhat horny, and in repose lie upon and form covers for the second pair. The latter are flimsy in texture, and larger than the former, in consequence of which they are so constructed that they can be folded so as to be covered by the first pair. These insects have biting mouth parts, and the metamorphosis is exceedingly slight. The members of this Order fall into two divisions, according to the structure of their legs. In the first division the hind legs are normal, and the insects' mode of progression along the ground is by running. In the second division the thighs (femora) of the hind legs are very large and powerful, and the insects progress by leaping. The first division comprises five families, the second division comprises three:—

Cursoria (runners)	1.	*Forficulidae*—earwigs
	2.	*Hemimeridae*
	3.	*Blattidae*—cockroaches
	4.	*Mantidae*—praying mantis
	5.	*Phasmidae*—leaf and stick insects
Saltatoria (leapers)	6.	*Acridudae*—short-horned grasshoppers and locusts.
	7.	*Locustidae*—long-horned grasshoppers.
	8.	*Gryllidae*—crickets.

Forficulidae—earwigs. The members of this well-known group are easily recognised by the characteristic pair of "forceps" at the posterior end of the abdomen. The body is long, and exceedingly mobile. The head is provided with long, and thread-like antennae, and with large facetted eyes, but there are no ocelli. The mouth parts are adapted for biting and chewing. The wings when present are characteristic. The first pair are thick and horny, and exceedingly short, but the second pair are much larger, and membranous, and are folded in a very complex manner, to go beneath

the wing covers. When folded thus, they are never completely covered, and a small portion of each wing can be seen to project from beneath its wing-cover, behind. Some species are wingless, and certain of the winged species are very seldom seen to use them. The legs are set very wide apart on the body. The life history is one with incomplete metamorphosis, the young bearing a very great resemblance to the adult. In the winged species the young may be distinguished by the absence of wings, or their presence in a rudimentary condition, but in the wingless species it may be exceedingly difficult to tell whether a specimen is young or an adult. The eggs are laid in the Spring, and the insect undergoes four moults before attaining the adult stage. In some species the maternal instinct seems to have attained a slight development, and the females of some species have been known to brood over their eggs. Earwigs have the reputation of being injurious to plants, but it is doubtful if they are the cause of much of the damage for which they are blamed. They certainly eat a few young shoots, petals of flowers, etc., but they seem to prefer a carnivorous diet. Earwigs may often be seen on tea bushes, lying almost entirely concealed in a half-opened leaf, or between two leaves which overlap, and it is by taking advantage of this habit of getting into holes and crevices that gardeners entrap them. Everyone will be familiar with the inverted flower pot, filled with straw or paper, and supported on a stick, without which no flower garden in England is really complete, and has seen the insects shaken out of the straw into a pail of water in the evening.

Blattidae—cockroaches—are familiar to all. In these insects the head is bent down, and is often entirely concealed from above by the first dorsal plate of the thorax, which is shield-like in shape. There is a large compound eye on each side of the head, and the moderately long antennae are inserted near to the eyes. Close to the antennae and the eyes are two small peculiar regions of a paler colour than the rest of the head, which are known as the fenestra, and are in some instances replaced by ocelli. Wings may or may not be present. In cases where they are fully and typically developed they consist of two pairs of which the front pair acts as a cover for the hind pair, which latter are often folded in a very complicated manner. The legs are characteristic. All the basal joints, or coxae, are extremely large, and entirely cover the lower surfaces of the three thoracic segments. The tibiae, and frequently the femora, are provided with numerous large spines, and the tarsi are five-jointed. There are two claws at the end of the tarsus, frequently with a small lobe between. The abdomen is large and well-segmented, and provided behind with a pair of jointed processes known as "cerci." As in the case of earwigs, cockroaches show incomplete metamorphosis. The eggs are laid in a horny capsule, which is carried about by the mother until she finds a convenient place in which to deposit it. The young emerge having a superficial appearance very similar to that of the adult, and undergo from five to seven moults, the wings appearing at the last moult. Cockroaches seem to be fond of a mixed diet, but some people have supposed dead animal matter to be their natural food. They are not injurious to tea, but one of the commonest cockroaches in the tea districts, *Phyllodromia germanica*, has been reported from Darjeeling to have been found eating Blister Blight.

Hemimeridae—an obscure family parasitic on animals in Africa.—*The Quarterly Journal of the Scientific Department of the Indian Tea Association.*

(To be continued.)

RUBBER.

Batavia Rubber Congress.

Catch Crops and Inter Crops.

R. W. Munro, Morib, Selangor, F. M. S.

When a plantation is devoted to one crop only, such as rubber, and planter's exchequer continually having calls made upon it for at least four years, his thoughts more or less naturally turn to the question of how a decrease in the upkeep expenditure may be brought about, and possibly some revenue from the land obtained during the time that his trees are working their way towards maturity, and it has been the aim and object of a very large proportion of owners ever since the commencement of the plantation rubber industry to find something that would prove to be even a small assistance in bringing about the desired results.

Now, dealing with the very wide subjects, "Catch Crops and Inter Crops," the much-discussed question of planting distance for the rubber is one which is bound to receive the first and foremost consideration. I do not propose to touch upon this equally wide subject in the present treatise except merely to state without any fear of contradiction that the economic value of catch crops in general is not worth considering on estates where the principle of close planting of the main crop is still adhered to.

We will assume then that some such distance as 30 by 15 feet is decided on for the rubber, and that a catch crop of one kind or another between is under discussion.

Now the chief danger that presents itself is in the knowledge that certain inter crops, such as coffee, tea, tapioca, and a few others have been found to yield fairly substantial returns for quite a number of years.

I call this a danger, because of the natural tendency to continue the minor cultivation when the well-being of the main crop is being sacrificed for the sake of the return from the former. I have seen striking instances of this myself, and it can well be realised how easy it is to ignore the fact that the above sacrifice is taking place.

But as we wish to weigh the merits, and the de-merits, of the general principle, it must of course be assumed that the planter will eliminate the catch or inter crop at any expense as soon as he satisfies himself that the main crop is suffering, no matter how much his immediate loss may be by so doing.

Granted that he does so, he will then ask himself: "Has it been worth the money expended?" "What net profit have I derived since the inception of the experiment?"

Whatever the crop happens to be, it is only the ignorant or non-observant person (granted that the requisite funds and labour are available) who fails to give to it cultivation in some form or another, and it is obviously a very costly business to give intense cultivation to two crops interplanted.

Apart from the exhausting properties of most of the crops (excepting the leguminosae) the fact remains that when we decided to establish a catch or inter crop we are apt to lose sight of the question of capital cost entailed in so doing, and also the cost of production. Additional capital must be put aside for buildings, recruiting, medical, superintendents, and other general charges.

We find that unless crops can be secured for at least four or five years (and this result owing to the heavy shade of the rubber is not at all a likely one to be obtained even with special cultivation) there is little justification for the above expenditure.

A very important point must be considered also, and that is, the question of what pays the native to do on a small scale, would not, as a rule, be profitable for the European planter to embark upon.

It is well known that such crops as tapioca, pineapples, sisal, lemon or citronella grass and sugar are most exhausting to the soil, and could never be thought of as paying crops for the rubber planter.

The Chinese sweet potato is now commonly seen on European estates, but only as a cover, as it impoverishes the soil to a very great extent to take away the roots from the land, and must not be placed by the European planter in the category of catch crops. In a lesser degree tea and coffee are found (when cut out to assist in the development of the main crop) to have left the soil in anything but a desirable condition, and it is at this stage that it may be found necessary to have recourse to artificial manuring, as it would prove impracticable to try and put back into the soil anything by means of a green manure owing to the spread of leaf of the rubber trees, and consequently the lack of sufficient light. Without wishing to lay down any law in dealing with cultivation in the abstract, the two points most worthy of consideration, are these, *viz.*, (1) The nature of the soil under cultivation ; and (2) The natural requirements of the tree itself. Assuming that our soil is not obviously deficient in the recognised fertilising ingredients, there will almost always be a certain amount of material available and to be taken advantage of to avoid unnecessary expenditure on artificial manure.

The usually accepted constituents of plant food, viz., nitrates, phosphates, potash, and lime, can be made available on a very large proportion of the soils in this country, but as a matter of fact they very seldom are.

From personal observation it seems to me to be a most essential point to endeavour to give as much humus as possible to soils which are regarded as deficient in this respect, and I doubt whether green manures have been sufficiently tried with the view to supplying a remedy.

Constituent parts of any soil can, no doubt, be determined by analysis, but exactly how to make these available as food for the plant is quite another question.

The benefit derived from keeping the soil in a friable state by mechanical means or otherwise cannot be overrated.

Reverting to the main thesis, and regarding the varieties of crops other than those already mentioned that can be; and have been grown in this and the adjoining tropical countries, the following are perhaps the best known :— Bananas, cacao, gambier, castor oil, ginger, ipecacuanha, indigo, groundnuts, soya bean.

The last three of these are, of course, well known as nitrogenous plants, and are for this reason, therefore, like all their relations, greatly to be encouraged. I do not say that any of these have proved or are likely to be at all remunerative in the way of yielding hard cash to the planter to enable him to bring his main crop into bearing at any lower figure, in fact I would not encourage him to plant any of them with this idea at all.

The first one on the above list, bananas, has been found in some cases to be a success commercially, but not so any of the others. The cultiva-

tion of bananas amongst young rubber has shown very excellent results, both in reducing the weeding bill, and also in returning to the soil when the stools are cut out a very valuable amount of moisture and mulch. This has not, as a rule, been found an exhaustive crop, but is found to be a drawback to thorough superintendence, as the cover formed after a few months is so dense that it becomes impossible to have control over the coolies working in the area.

The notion has become very prevalent of late that it is necessary to resort to artificial manuring in order to develop the growth of the trees and increase the yield therefrom, and this method is often resorted to before it has become an accepted fact that the plants or trees have failed to respond to any other kind of treatment.

It is an acknowledged and significant fact that green manures sown on poor or used up soils are slow to establish themselves, but when once established they should, I think, be the means of improving the physical conditions of the soil more effectually and economically than by the application of artificial stimulus which may be found necessary to apply at more frequent intervals and at a higher cost. The important principle of cultivation would seem to be the protection of the feeding roots of the trees, and prevention of a check to their growth and welfare in the time of drought so that land on which a system of tilling and mulching is practised should under ordinary conditions, be capable of holding its own against anything artificial until, at any rate, the first crop has been taken off it.

For the benefit of those who realise the above facts, and who are anxious to obtain the material necessary to bring about the best results, I would mention the names of the following plants (seeds of which can be more or less easily obtained) which from my own personal knowledge I can state to have given excellent results :—

Tephrosia candida, Tephrosia purpurea, Mimosa pudica, Mucuna speciosa, Centrosema plumieri, Vigna dolichoides and Crotolaria striata.—*The India Rubber Journal.*

The average realised at the Mincing Lane auctions of the following teas, including new season's, for week ended the 25th September, 1915, as compared with the corresponding week's sale in 1913, is as follows : –

	Week ended 18th September.	Week ended 18th September.	Corresponding week in 1913.
Indian ...	8'54	8'92	9'56
Ceylon ...	8'49	8'47	8'95
Java ...	9'00	7'76	8'34

—*Indian Planters' Gazette & Sporting News.*

American Tea Statistics.

	lbs.
Net imports, 1912-13	93,911,055
Net imports, 1911-12	100,394,896
Net imports, yearly average 1908-13 ...	98,224,997
Average per capita consumption	0'98
Average per capita consumption higher period ...	1'58
Imports from Japan—per cent. of total ...	46'3
Imports from China—per cent. of total ...	25'3
Imports British grown—per cent. of total ...	27'3
Average Import cost, 5 years, per lb. cts. ...	17'1

—*Indian Planters' Gazette & Sporting News.*

TEA.

Pruning of Tea.

The Indian Tea Association recently published a monograph entitled, "Some Aspects of Modern Tea Pruning" compiled by Dr. G. D. Hope and Mr. P. H. Carpenter, which should be in the hands of every Tea planter. The pamphlet deals in an exhaustive way with the modern tendencies in pruning and after dealing with the general principles of pruning, the different methods adopted are described in detail, together with their respective advantages and disadvantages. Several of these methods are comparatively new.

The following abstract from the author's preface shows the scope of the work :—

"The success with which renovation of deteriorated tea has been accomplished is exemplified by large areas in Assam.

"Many cases can be cited of gardens, which at one time gave from four to five and are now yielding from seven to eight maunds of tea per acre, which are still continuing to improve.

"Further progress in the theory and practice of pruning has been the natural sequence of this renovation, and for two definite reasons :

1. All the collar and heavy-pruning, which took place a decade ago and is still being done where schemes of renovation are being carried out, made evident the importance of establishing some system of pruning whereby severe measures may be dispensed with, and temporary loss in crop and other evils which follow the treatment avoided as far as possible.

2. With the introduction of better agricultural practice more correct methods of pruning could be adopted with safety than before.

"Before tea culture had reached an intensive stage in other directions the full benefit of pruning in remedying defects in the framework of bushes could not be obtained, for heavy or collar pruning was followed then in many cases by serious loss in crop for several years afterwards, the re-formation of the bushes after severe pruning being naturally slower when no applications of manure were made to help them to recover. To realize the important principle which this fact illustrates—the interdependance of all those operations which have a direct bearing on the health of the bushes—is the key-note of successful garden work. Tea bushes which have been well cultivated and liberally manured are more healthy than those which have been treated indifferently and their relative vigour shows itself in the way in which they grow after being pruned severely. Improvements in the frame work of vigorous bushes may be effected by pruning of whatever kind be necessary, for owing to their free growth new strong shoots soon develop and take the place of the branches which have been removed, and the bushes become larger and stronger than before, and also the cutting away of twigs and dead and unhealthy wood enables vigorous bushes to benefit from good cultivation and manuring, for the energy of the bushes is then devoted entirely to the production of leaf and flushing shoots instead of being expended in increasing the size of knots and the number of unproductive twigs and shoots. Indeed bad and useless wood *must* be removed before bushes can benefit fully from intensive treatment of the soil, Pruning alone however can never be in itself a remedy for weakness of bushes.

"At a time when cultivation was often indifferent and nothing was used with the object of ameliorating the soil except occasionally lime

manure, and when in consequence a large part of the tea in North East India consisted of ill-shapen and unhealthy bushes, it was not to be wondered at that so little first-class pruning was done. In many cases any attempt at removing bad wood without severe pruning of the bushes of whole sections would have been useless; heavy pruning alone proved effective, but usually with serious loss in crop for several seasons subsequently, and frequently with the final result that the bushes were but little better than before. In the worst cases bushes either died or were further weakened by the pruning.

"Several important steps towards the solution of the problem of correct pruning are of recent development and were unknown five years ago. They are at present put into practice fairly generally, though with numerous exceptions, in Assam, and by a few planters elsewhere who have become acquainted with the system on which they are based and its advantages. The system involves the application of no principles of pruning differing from those laid down by Watt and Mann. The change for the better in the state of health and vigour of the average bush, as the result of more intensive treatment in every way, has made new methods, and developments of old-established methods, possible. But the underlying principles are the same."

A method of pruning by taking out centres is described and especially recommended as the remedy for bushes which have developed bad wood. The authors conclude their most valuable monograph, which all Tea planters should procure and read for themselves by saying:—

"If the theoretical principles on which pruning is based and their practical applications be, or have in the past been neglected, a bush will have to be cut down eventually however vigorous its growth may have been.

"It is worth while considering therefore what the details of the method should be, whereby the continuity of bushes of a suitable height for plucking, and with sufficient new wood to maintain the new bush in full bearing, may be ensured.

"The essence of such a system is after all the removal of a branch, not at the same height as other branches of the bush wherever that may happen to be, but always at the junction with another branch and never elsewhere except in dealing with the top-most shoots of the bush. The result is that no snags are formed and therefore there should be no bad wood in the bush at all. We have already shown that this principle is realized and acted upon in carrying out the pruning known as "taking out of centres" and generally now-a days in cases where first class pruning is done.

"After a young plant has been developed into a plucking bush or after a bush has been renovated correctly, light pruning (under which name we include top pruning, thinning out, spacing out, and cleaning out) combined with the removal of some of the heavier branches of the bush each year always at the point of junction with another branch, can be so carried on that the general flushing area of the bush will be maintained at a suitable plucking height. In this way renovation pruning which always adversely affects the yield for a few years would not be necessary. It will probably be found advisable in practice to attend to the requirements of the inside of the bush at intervals of a few years. The year following that in which particular attention is paid to the insides, the desirability of leaving bushes unpruned should be considered because it has, as has been pointed out above, a very beneficial effect on the bush."

R. D. A.

LAND FOR AGRICULTURE.

The Australian Meeting of the British Association.

Section M.

AGRICULTURE.

Address by A. D. Hall, M.A., F.R.S., President of the Section.

The President of a section of the British Association has two very distinct precedents before him for his address; he can either set about a general review of the whole subject to which his section is devoted, or he can give an account of one of his own investigations which he judges to be of wider interest and application than usual. The special circumstances of this meeting in Australia have suggested to me another course. I have tried to find a topic which under one or other of its aspects may be equally interesting both to my colleagues from England and to my audience who are farming here in this great Continent. My subject will be the winning of new land for agriculture, the bringing into cultivation of land that has hitherto been left to run to waste because it was regarded as unprofitable to farm. To some extent, of course, this may be regarded as the normal process by which new countries are settled; the Bush is cleared and the plough follows, or under other conditions the rough native herbage gives way to pasture under the organised grazing of sheep or cattle. I wish, however, to deal exclusively with what are commonly termed the bad lands, inasmuch as in many parts of the world, though recently settled, agriculture is being forced to attack these bad lands because the supply of natural farming land is running short. In a new country farming begins on the naturally fertile soils that only require a minimum of cultivation to yield profitable crops, and the new-comers wander further afield in order to find land which will in the light of their former experience be good. Before long the supply is exhausted, the second-class land is then taken up until the stage is reached of experimentation upon soils that require some special treatment or novel form of agriculture before they can be utilised at all. Perhaps North America affords the clearest illustration: its great agricultural development came with the opening up of the prairies of the Middle West, where the soil, rich in the accumulated fertility of past cycles of vegetation, was both easy to work and grateful for exploitation. But with the growth of population and the continued demand for land no soils of that class have been available for the last generation or so, and latterly we find the problem has been how to make use of the arid lands, either by irrigation or by dry-farming where the rainfall can still be made adequate for partial cropping, or, further, how to convert the soils that are absolutely poisoned by alkali salts into something capable of growing a crop. You yourselves will supply better than I can the Australian parallels; at any rate we in England read that the wheat-belt is now being extended into districts where the low rainfall had hitherto been thought to preclude any systematic cropping.

Now, the fact that the supply of naturally fertile land is not unlimited reacts in its turn upon the old countries. During the 'eighties and 'nineties of the last century the opening up of such vast wheat areas in America, Argentina, Australia, and the development of the overseas trade, reduced prices in Europe to such an extent that in Great Britain, where the full extent of the competition was experienced, the extension of agriculture came to an end despite the continued increase of population. The area of land under cultivation has declined but little despite the growth of the towns, but the process of taking in the waste lands stopped, and

much of the land already farmed fell back from arable to cheaper pasture. But as soon as production in the newer countries failed to keep pace with the growth of population, prices began to rise again, and we are now in the Old World endeavouring to make productive the land that has hitherto been of little service except for sport and the roughest of grazing. Even the most densely populated European countries contain great areas of uncultivated land; within fifty miles of London blocks of a thousand acres of waste may be found, and Holland and Belgium, perhaps the most intensively cultivated of all Western countries, possess immense districts that are little more then desert. Of the European countries, Germany has taken the lead in endeavouring to bring into use this undeveloped capital; her population is rising rapidly, and fiscal policy has caused her to feel severely the recent increase in the prices of foodstuffs, which she has determined to relieve so far as possible by extending the productivity of her own land. It has been estimated that Germany possesses something approaching to ten million acres of uncultivated land, and a Government department has been created to reclaim and colonise these areas.

Before dealing with the processes by which the rough places of the earth are to be made straight, there is one general question that deserves consideration: Is it more feasible to increase the production of a given country by enlarging the area under cultivation, or by improving the methods of the existing cultivators? There is without doubt plenty of room for the latter process even in the most highly farmed countries: in England the average yield of wheat is about 32 bushes per acre—a good farmer expects 40; the average yield of mangolds, a crop more dependent upon cultivation, is as low as 20 tons per acre when twice as much will not be out of the way with good farming. A large proportion of the moderate land in England is kept in the state of poor grass—even as grass its production might be doubled by suitable manuring and careful management while under the plough its production of cattle-food might easily be trebled or quadrupled. Why, then, trouble about adding to the area of indifferent land when so much of what has already been reclaimed, upon which the first capital outlay of clearing, fencing, roadmaking, etc., has been accomplished, is not doing its duty? We are at once confronted by the human factor in the problem. The existing educational agencies which will have to bring about better farming will only slowly become effective, and however imperfect they still may be in England, they are mainly so because of the lack of response upon the part of the farmers. The present occupiers of the land do obtain in many cases a very inadequate return from it, but they make some sort of a living and they hold it up against others who, though they want land, cannot be guaranteed to use it any better. I proved farming means more enterprise, more knowledge, often more capital, and the man who can bring these to the business is far rarer than the man who, given a piece of land even of the poorest quality, will knock a living out of it by sheer hard work and doggedness. While, then, there should be no slackening in our efforts to improve the quality of the management of existing land, there is a case for also using every effort to increase the cultivable area; indeed, it is probable that for some time to come the second process will add most to both the agricultural production and the agricultural population.

Let us now consider what are the factors which determine the fertility of the land that is first brought into cultivation and remains the backbone of farming in the old settled countries. Foremost comes rainfall, and the

distribution is almost as important as the amount. Winter rain is more valuable than summer, and though cereal-growing is none the worse and may even obtain better results with a rainless summer, stock-raising and the production of fodder crops are the better for a rainfall that is distributed fairly evenly throughout the year. Rainfall, again must bear some relation to temperature; some of the best farming in the Eastern Countries of England is done on an average rainfall of 20 inches! there are great areas in South Africa with the same average rainfall that are little better than desert. In temperate regions we may say that the naturally fertile land requires a rainfall of from 20 to 50 inches per annum, not too much segregated into seasons, and some at least falling in the winter.

If the rainfall is excessive or the drainage inadequate to carry it off, the formation of peat is induced resulting in such uncultivated areas as the bogs of Ireland and the moors of Eastern England, Holland, and Germany.

Given suitable rainfall and temperature the texture of the soil becomes a factor of importance; if too coarse and sandy, so little of the rainfall is retained that we get all the effects of drought secondarily produced. In itself the open texture of a coarse, sandy soil is favourable to plant development; under irrigation, or where the situation is such as to result in permanent water a short distance below the surface, fine crops will be produced on sandy soils that would remain almost barren if they only depended upon the rainfall for their water. In Western Europe large areas of heaths and waste land owe their character to the coarse and open texture of the soil. At the opposite extreme we find clays so heavy that their cultivation is unprofitable; such soils, however, will carry grass and are rarely left unoccupied. For example, in the south-east of England there are a few commons, *i.e.*, land which has never been regarded as worth enclosing and bringing into particular ownership, situated on heavy clay land; most of such land is pasture, often of the poorest, or, if at any elevation, has been covered with forest from time immemorial.

One last factor in the soil is of the utmost importance to fertility, and that is the presence of lime—of calcium carbonate, to be more accurate—in quantities sufficient to maintain the soil in a neutral condition. Old as is the knowledge that lime is of value to the soil, we are only now beginning to realise, as investigation into the minute organisms of the soil proceeds, how fundamental is the presence of lime to fertility. A survey of the farming of England or western Europe will show that all the naturally rich soils are either definitely calcareous or contain sufficient calcium carbonate to maintain them in a neutral condition even after many centuries of cultivation. Examples are not lacking where the supply of calcium carbonate by human agency has been the factor in bringing and keeping land in cultivation. I have discussed one such case on the Rothamsted estate, and several others have come under my notice. The amelioration of non-calcareous soils by treatment with chalk or marl from some adjacent source has been a traditional usage in England and the North of France; Pliny reports it as prevailing in Gaul and Britain in his day; and the farmer of to-day often owes the value of his land to his unknown predecessors who continuously chalked or marled the land. Upon the presence of carbonate of lime depends the type of biological reaction that will go on in the soil, the beneficial bacterial processes that prepare the food for plants only take place in a medium with a neutral reaction. The Rothamsted soils have provided two leading cases.—*Nature.*

(To be continued.)

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c , and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil.

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,

The United Planters' Association of Southern India,

BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Scientific Expert contributes an article on Coffee Manuring on a Scientific Basis and gives the result of four years' experiments made by Mr. Wilkins, which shows the value of Scientific advice. Considering the result from such advice the Scientific Expert has to be congratulated and has good grounds for stating that "it is a sound proposition financially." He also gives an extract from the *Hindu*, for what it is worth, on a Substitute for Acetic Acid for Coagulation purposes and an extract from a letter from Mr. Eaton, Federated Malay States Agricultural Department, on the coagulation of latex, and a short note on the study of Soil Fertility.

The proceedings of the Annual General Meeting of the Bababudin Association are published and include the President's speech and the Report of the Delegate to the U. P. A. S. I. Meeting.

A short report of the proceedings of the Central Travancore Planters' Association is published.

The Board of Trade Journal furnishes us with the statistics of cultivation of rubber in 1913 in the Federated Malay States.

We are much indebted to Mr. Bernard, of Messrs. Parry & Co., for a letter on the Position of the Fertiliser Supply in South India, which will be read by all planters with interest. The two last paras are especially valuable in view of the present circumstances.

The Director of the Labour Department has shown us a letter from a subscriber in which the following words occur: "There is no doubt the Labour Department is beginning already to make itself felt, these defaulters are running from pillar to post." This is a hopeful sign of the utility of the Department in its infancy, and the more information given to the Director the more its sphere of usefulness will increase.

There have been a good many of the Planting Community here lately on short visits. Many of them have come down with the intention of applying to join Indian Reserve of Officers, in which we trust they will be successful.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Coffee Manuring on a Scientific Basis.

In May 1913, Mr. P. M. Wilkins wrote an article in the *Chronicle* (VIII. p. 208) describing a manurial system he was carrying out on his Hoskerry Estate in North Coorg. This system was laid down in consultation with the Scientific Department and it was originally based on chemical analyses of the different types of soil on the estate. The estate of 50 acres was divided up into five sections and the manures applied to each section each year bear a carefully considered relation to those applied the year before on the one hand, and to those to be applied the following year on the other. The system has now been carried out for four years and the results are so good that they are summarised below for the benefit of other Coffee planters, who are advised to adopt a system of manuring in the same way.

The experiment began in 1911. Before that the crop picked from the 50 acres in three years was 20 tons; an average of 6·6 tons or 2·6 cwts per acre. In the four years of the experiment, including the present crop which has been estimated, 51¼ tons will have been picked from the 50 acres; an average yield of 12·8 tons or 5·12 cwts per acre. Hence the crop has been doubled, and this in spite of the fact that this year there was abnormally bad rain at the blossom time, so that the 1914-15 crop is disappointingly small. The following summary shows the crops picked, the 1910-11 figures being before beginning the system:—

	1910-11.	1911-12.	1912-13.	1913-14.	1914-15.
	Tons.	Tons.	Tons.	Tons.	Tons.
Section I— 5 Acres ...	*2*	1½	3	1¼	2
Section II—10 „ ...	*2½*	2	4½	2	2
Section III—10 „ ...	*1½*	1	2½	4	3
Section IV—10 „ ...	*2*	3½	4	3	2
Section V—15 „ ...	*1*	1½	4	2½	2
Totals ...	*9*	9½	18	12¾	11

The cost of the system on 50 acres is shown in the table below. In 1910 one application of manure was given in March; from 1911 to 1913, two applications a year have been given, one in March and one in November. This year 1914 only one application has been made, that in March; the November application will be omitted owing to reasons of economy caused by the war.

Year.	Cost of Manures and Cart-hire.	Cost of Application.	Total.
	Rs.	Rs.	Rs.
1910—11	1,150	75	1,225
1911—12	1,770	100	1,870
1912—13	2,597	140	2,737
1913—14	2,320	126	2,446
1914—15	1,580	131	1,711

Taking the 1910-11 figures as the average annual expenditure on manuring before the system was begun, which is approximately correct since the same manures were applied, Bones and Poonac, year after year, with an average crop of 6'6 tons of Coffee the expenditure per ton of crop was about Rs.185. With the new system the average expenditure on manures per annum from 1911 to 1914 is Rs.2,192 and with an average crop of 12'8 tons the expenditure per ton of crop is only Rs. 172. It may be objected that this is not a fair way of using the figures since only one of the two intended applications was made this year. If, however, we put the cost of manuring this year at the same figure as last year, viz., Rs. 2,446, it makes the cost per ton of crop Rs.186. Hence it will be seen that the system adopted has not only doubled the crop, but has done so with no greater expenditure then was incurred in getting a small crop, so that it is a sound proposition financially.

Substitutes for Acetic Acid for Coagulation Purposes.

In continuation of this subject the following which appeared in the *Hindu* of 4 November is quoted for what it is worth:

"An important discovery, says the Colombo correspondent of *Commerce*, has been just made by a well known planter of the Kandy District in the use of the Milk in the Coconut, or the water as it is commonly called, as a coagulant for Rubber. The Coconut water is allowed to ferment for 4 days and the liquid used coagulates latex, producing a superior Rubber, very much better than that obtained from the use of Crude Acetic Acid. From one to two ounces of the liquid was used for a pint of pure latex, the colour of the rubber produced was very good, clearer than that produced from Cocoa fermentation. Experiment should now be made to determine how long the liquid can be kept or preserved, and whether it is practicable to transport it from Coconut Estates to Rubber Estates. The millions of gallons of Coconut water which run to waste on Estates in copra drying and desicating mills can now be profitably utilised. The coagulant is obviously the cheapest."

This must be treated with a certain amount of reserve until further experiments have been conducted. It is a similar process to that suggested by the Ceylon Agricultural Department of using toddy-vinegar. Coconut water contains a certain amount of sugar and, when fermented, probably produces a vinegar, or dilute solution of crude acetic acid, or something closely allied to it. The yield is small and transport difficulties will be great and many of the South Indian rubber estates are not favourably situated with regard to Coconut areas.

All the correspondence on this subject goes to show that there are many substitutes for Acetic Acid should the necessity arise and experiments are needed to discover which is the cheapest, best, and most easily handled of these in estate practice.

Experiments are now called for with: Sulphuric Acid, Ammonium Sulphate, Aluminium Sulphate, Sodium Bisulphate, and fermented Coconut water. Who will volunteer to conduct experiments with any or all of these coagulants? As before started I can arrange to send a free sample of sodium bisulphate to anyone who wishes to experiment with it.

Mr. B. J. Eaton of the Federated Malay States' Agricultural Department suggests that the latex should be allowed to coagulate by itself in the absence of air, which does away with the objection of the foeted smell produced by latex allowed to coagulate by itself in the open. He writes in the *Malay Mail* of 22nd October as follows:—

"With the possibility of there being a shortage of acetic acid, which has been discussed recently, the following methods of coagulating latex are suggested and may eventually prove excellent methods to adopt entirely in lieu of acetic acid or other coagulants. The first consists in allowing latex to coagulate naturally under anaerobic conditions, *i.e.*, in the absence of air. It has been known for some time that if latex is allowed to coagulate naturally in open vessels, a milky slime forms at the surface and the amount of this slime is in proportion to the surface of latex exposed: natural oxidation also occurs and produces a dark rubber or a rubber with dark streaks or patches. If the vessel in which the latex is allowed to stand be filled completely and rendered practically airtight, anaerobic fermentation alone occurs with complete coagulation and the rubber produced is of a good colour after creping and drying. Any small portion from the surface which may be discoloured accidentally can be separated and made into second grade. This coagulation is carried out preferably in tall narrow vessels which may be covered by means of a board or other suitable cover to render the vessel practically airtight. If a paler crepe is desired the coagulated lump of rubber can be soaked for a few hours in dilute solution of sodium bisulphite or dried in an atmosphere of carbonic acid gas, by burning charcoal in the drying rooms. Preferably pure undiluted latex should be used that coagulation may be complete in about 7 or 8 hours, but the rubber may be left in the serum till the following day if desired. The other method produces a smoked and therefore a dark rubber. It consists in allowing latex in thin layers in shallow trays to coagulate in a smoke house. A thin layer is added daily on the top of the previous day's layer, which is already coagulated, and the process continued till a thick slab is obtained, the rubber being removed from the trays after a period of a week or a fortnight so that each slab represents latex collected over a period which means greater uniformi y in the product. Some of the moisture remaining in the slab can be removed by pressing in blocking machines."

The Study of Soil Fertility.

Ever since the Rothamsted Experimental Station has been established, it has devoted its attention principally to problems of soil fertility. In the *Journal of the Board of Agriculture* (August 1914), the present Director (Dr, E. J, Russell) points out that soil fertility, though originally believed to depend on the presence of sufficient plant food, is in reality dependent upon at least six factors: (1) the amount of plant food in the soil, (2) the amount of water present, (3) air supply, (4) the temperature, (5) suffiicient space for root development, and (6) absence of injurious agents. At the present time attention is concentrated at Rothamsted on the first and last of these. In the former, as well as the mere provision of plant food in the form of suitable manures, essential points for study are the control of waste, the changes which the manure undergoes in the soil, and the proper balancing of manures. This latter point is exceedingly important, for it has been found that the plant, like the animal, needs for its best development a sort of 'balanced ration' so to speak—it can make more use of its nitrogen supply in certain forms and in combination with other kinds of nutrients just as the animal can use its organic nitrogen most advantageously in conjunction with fixed quantities of carbohydrates.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Bababudin Planters' Association.

The third Annual General Meeting of the Association was held at the Santaveri Travellers' Bungalow on October 28th, 1914.

PRESENT.—Messrs. A. B. Boyd (President), W. Barnard, A. C. W. Denne, H. Kerr, N. G. B. Kirwan, F. D. Meppen, L. F. Powell, C. Sylk, S. J. Wilson, O. Watson, and S. H. Dennis (Honorary Secretary). *Visitor*: Mr. N. A. Barnard.

The Minutes of the last meeting were read and confirmed.

I. *President's Address*:—I fail to see that I can tell you much that you do not already know, as everything of interest to planters is published weekly in the *Planters' Chronicle*, and the Honorary Secretary's report deals with the accounts of our Association. The last few months have been momentous ones in the annals both of the British Empire, and of the planting community of Southern India. In August last the British Empire was forced into a European War, in defence of its treaties, by the action of a country which looks on Treaties as simply bits of paper to be torn up at any moment, when it thinks fit to do so. A country, which, if half the reports we hear are true, carries on war in a manner only to be expected from a nation devoid of all civilization. We firmly believe that our Empire and her Allies will teach the common enemy a lesson which she will never forget, though they will never be able even partly to repair the damage done by the savage Hordes, who respect neither women nor children to say nothing of places of worldwide fame and interest. As for the planters of Southern India they are to be congratulated on at last having shown some sign of unity, as I think I may say that the majority of them have at last started a Labour Department of their own, a thing that has been talked about for many years but never carried till now.

All who subscribe to the Department firmly believe that it will be the means of solving the Labour difficulties, which have hampered them for some years. Those who hold aloof on account of the cost ought to remember that if only they would join, the subscription per acre could be greatly reduced and that one really strong Department would do more good than dozens of small ones.

As regards the Scientific Department of the U. P. A. S. I., the Government of Madras has made us a very good offer. They propose to take over the Department and run it on proper lines for our benefit, provided we are willing to pay a certain sum, as our share of expenses. At one time there was a doubt as to whether the money could be raised, but I now hear the Executive of the U. P. A. S. I., have solved the difficulty and see their way to raising the money. If this is so, there need be no difficulty in handing over the Department to the Madras Government.

To refer to Coffee, I am sorry to say that Green Bug seems still to be spreading. But now that Dr. Coleman, the Director of Agriculture for Mysore and his staff have tackled it, I feel sure some means will be found, not only for checking it, but for stamping it out.

I am glad to hear that Dr. Coleman now proposes to tackle Coffee Borer, a subject of great importance to most of us. But the sooner the Mysore Government introduces a Pest Act to strengthen his hands, the better for us all. I am glad to say that Coffee everywhere seems to be recovering from the effects of the long drought of last season. Crops this year will be small, but the prospects for the next one look good. Judging from Home

Reports I do not think we need be afraid of not being able to sell our coming crop at fairly good prices. Extra pay to both men and women seems to have done good, as most places have as many coolies as they require at present, though many of them require more for crop.

As for the roads round here I am sorry to say that in spite of the increased allowance for their up-keep, progress has been very slow, but I sincerely hope that great improvement will soon be shown. All planters know the great difficulties our energetic Executive Engineer has to contend with and sympathise with him. We quite realise that he is doing his best for the roads. As regards the Bababudin Hill Road, I trust the Government will favourably reconsider the requests of all planters and others interested in the road.

The Santaveri Dispensary is again on to-day's Agenda and I think Government might do something to meet our wishes on the subject, as a dispensary at Santaveri would benefit a number of Government villages as well as our estate coolies. At present we have no medical assistance of any sort and in cases of serious illness, have to send about 20 miles to the nearest Hospital. This means that it may be days before any medical man turns up.

II. *Honorary Secretary's Report for year* 1913-14.

Accounts.—All accounts for the past year are on the table.

The balance at credit of the Association at June 30th, 1914. (the end of our Financial year) was Rs. 2,068-3-8, out of this sum Rs.1,590 was due to the Assistant Scientific Officer Fund and was paid in July 1914, so that the balance to be carried forward to the current year after meeting all liabilities is Rs.478-3-8.

We opened the past year with a subscribing area of 5,721 acres, 1 member resigned and a new member joined, the year closing with 5,695 acres, a decrease of 26 acres. All subscriptions for the current year have been paid with 2 exceptions. The Planters' Benevolent Fund subscriptions are not all in.

Estimates for Current year (1914-1915).

	Rs.	A.	P.	Rs.	A.	P.
Revenue—						
5,695 acres at 8 as. per acre ...				2,857	8	0
Expenditure—						
Subscription to U. P. A. S. I. 5,695 acre at 2 as. per acre ...	711	14	0			
4th year's subscription to the Asst. Scientific Officer Fund ...	1,800	0	0			
Typewriter, purchase of ...	200	0	0			
Stationery	20	0	0			
Postages	24	0	0			
„ Council of Planters' Associations ...	10	0	0			
				2,765	14	0
Balance ...				91	10	0
Balance forward from June 1914 ...				478	3	8
Estimated credit balance at June 30th, 1915 ...				569	13	8

Before closing I must thank the President and members for all the help they have given me during the past 7 months. I have now much pleasure in placing my resignation in your hands.

The Report was passed and Messsrs. Denne and Barnard asked to audit the past year's accounts.

III. *Bababudin Hill Road.*—Two letters from the President, District Board, Kadur District, dated July 24th, and September 10th, 1914, anent the maintenance of the road and the establishment of a Toll gate on this road were read. The matter was discussed in detail by the meeting and Mr. Kirwan pointed out the trouble and annoyance the Toll gate was giving.

A meeting was to be held in Chickmaglur on November 3rd, to protest against it.

Proposed by Mr. Boyd and seconded by Mr. Sylk: "That Messrs. Hugonin, Lovett and Kirwan represent the Association at the meeting to be held in Chickmaglur on the 3rd November."

IV. *Green Bug Insecticides.*—Two letters from Dr. Leslie C. Coleman, Director of Agriculture to the Government of Mysore dated 1st August and 7th October, 1914 were read pointing out the superiority of fish oil soap resin as manufactured by the oil Chemist, Madras Fisheries Bureau, over other Green Bug spraying mixtures, and informing us of an unavoidable delay having taken place due to the Oil Expert having to get caustic potash from England and the insecticide not being available before January, 1915. Four more members intimated their desire for some.

V. *Santaveri Dispensary.*—Read memo. No. L. F. 14 dated 30-7-1914 from the President, District Board, Kadur District, with reference to Government of Mysore's decision on this matter.

The meeting expressed disappointment that the Dispensary promised by Government some time ago was not yet an accomplised fact and that Santaveri was only likely to be served by one of the itinerating Dispensaries proposed in connection with the scheme for the improvement of the Malnad.

The following resolution was proposed by Mr. Denne and seconded by Mr. Sylk and carried;--"That this Association regrets to see that Government has not yet seen fit to provide medical attendance for an important District like Santaveri and hopes that something will soon be done.

VI. *Delegates Report to U. P. A. S. I. Meeting.*—The Report was read by Mr. Dennis.

Mr. Chairman & Gentlemen,—Mr. Boyd and I attended the meeting as your Delegates. We shall not bore you with a repetition of all that appeared in the press, a brief summary of the proceedings will suffice,

First and foremost the Labour Department was floated and waverers can still come in on equal terms with original supporters if they decide to do so before June, 1915 as per the following rssolution passed:—

"That any Estate joining the Department 12 months after the starting of the Labour Department shall pay an entrance fee of Re.1 over and above the Rs.2 per acre, but that any new interest or estate changing hands, not having had the chance of joining previously shall be allowed to join on the original terms." It was agreed that with the exception of the 2 members, representing Messrs. Jas. Finlay & Co., on the committee, all vacancies occurring will be filled by the vote of U. P. A. S. I. Council.

Scientific Department.—With reference to the proposal that the Government of Madras, should take over the Scientific Department and run it in co-operation with ourselves, so that it should further develop, their scheme is to add a Mycologist to the Scientific Staff and establish an experimental station probably on the Anamalais.

To do this the Madras Government are prepared to give 5 times their present contribution and the U. P. A. S. I., are asked to increase their share from Rs.9,000 to Rs.15,000 an increase of Rs.6,000. Rs.1 800 per annum was subscribed at the meeting.

Hybridisation.—The experimental plot on the Nilgiris judging from Mr. F. H. Butcher's (Curator of the Government Botanic Gardens) Report is not doing well.

Green Bug.—With the advent of Green Bug in the District it was impressed upon us by Dr. Coleman that immediately it is noticed systematic spraying must be adopted and every effort should be made to prevent it spreading to the shade and a crusade conducted against the ants who spread it. Dr. Coleman is taking measures to combat it on affected native estates. He has told us not to get any green stuff from Bangalore as it was difficult to say what did or did not harbour it.

Pest Act.—We again supported a resolution asking the Government of Madras to legislate for an internal Pest Act to control pests already established in planting districts and also to approach native Governments. Dr. Coleman emphasised this and said he was going to ask the Mysore Government for a Pest Act as it was impossible to do anything without one.

Adulteration of Coffee.—On this subject, last year's resolution was re-affirmed and in addition to that the U. P. A. S. I. co-operates with the Rangoon Chamber of Commerce in the measures they are taking.

Railways.—The Arsikere-Mangalore Railway is practically sanctioned and there is every probability of the work being taken in hand shortly.

Planters' Benevolent Fund.—This fund has Rs.17,000 invested in Government paper. During 1913-14 four applications were made. It is hoped all members will give it their support.

School of Tropical Medicine.—The Government of Madras were unable to help this as there is to be a school in India which will require their support. It is to be hoped it will be located in South India.

VII. *Scientific Department.*—Read Chairman of U. P. A. S. I.'s Circular letter dated October 5th.—Proposed by Mr. Boyd seconded by Mr. Denne that Mr. W. S. Johnson be asked to represent the Association at the meeting to be held in Madras in December.

VIII. *Gift of Coffee for troops at front.*—This proposal met with unanimous support and the following resolution was proposed by Mr. Kirwan seconded by Mr. Barnard and carried:—" Members present are in favour of contributing to the War Coffee Contribution and will refer to proprietors for sanction."

Imperial Indian Relief Fund.—The Hony. Secretary was instructed to forward to the Honorary Secretary, Imperial Indian Relief Fund, Mysore and Coorg Branch as a first instalment, the subscriptions (Rs.555) that had come in.

IX. *Labour.*—Mr. Barnard's complaint against a neighbour was discussed and the following resolution proposed by Mr. Kirwan and seconded by Mr. Barnard was carried.—" That this Association protests to the proprietors of the Lal-Bagh Estate against their paying a higher rate of pay to coolies than other Estates in the District, especially bearing in mind the fact that they have not availed themselves of the existing organisation to raise and regulate the labour force of Southern India."

Next Meeting.—It was decided this should take place in Chickmaglur not before the end of March.

Election of Office Bearers—

Result:—Mr. Boyd ... ... President.
Mr. Denne... ... ... Vice-President.
Mr. Dennis ... ... Honorary Secretary.

Members of Council of Mysore Planters' Associations: Messrs. Hugonin, Kirwan and Dennis.

The Meeting closed with a vote of thanks to the Chairman.

(Signed) A. B. BOYD,
Chairman.

(") S. H. DENNIS,
Hon. Secretary.

Central Travancore Planters' Association.

The Third Quarterly General Meeting of this Association was held on Saturday the 31st October at the Travellers' Bungalow, Peermade, at 10 a. m.

Present.—Messrs. H. C. Westaway (Chairman), W. H. G. Leahy (Vice-Chairman), J. S. Wilkie, F. Winterbotham, W. H. J. Milner, C. A. Mackenzie, A. R. St. George and R. P. Roissier (Honorary Secretary.)

The Minutes of the last Meeting were taken as read and confirmed.

1. *Correspondence.*—All correspondence since the previous Meeting was read and the following papers were laid on the table:

Press *Communique* from the Government of India, Department of Commerce and Industry, dated 16th August. Circular letter from the Superintendent, Devicolam Division, No. 549 of the 1—2—1090. Circular letter No. 754 of 14 from the Resident of Travancore and Cochin. Circular letter No. 860 of 9th October from the Superintendent, Devicolam Division. Circular letter No. 686 of 5th October from the Superintendent, Devicolam Division.

2. *War Funds & Subscriptions.*—With reference to correspondence on the subject of the proposed gift of Tea to the Russian Troops, it was proposed by Mr. Wilkie and seconded by Mr. Leahy:—" That the Honorary Secretary do write to the Russian Consul at Colombo asking what grades of Black Tea would be most suitable for this gift."—*Carried.*

Regarding the subscriptions collected from Members of the Association for War Funds, it was resolved that the sum of Rs.300 having been collected half of this shall be sent to the Imperial Indian Relief Fund and half to the Prince of Wales' Fund.

It was decided at this Meeting that a Fund be opened to which Members may subscribe and it will be settled at each quarterly meeting to what Fund the amount collected shall be allotted. Subscriptions to be sent in to the Honorary Secretary.

3. The advisability of issuing Rice to the Coolies at cost price. It was resolved that this matter stand over.

4. *Election of Sri Mullam Delegate.*—Mr. Wilkie was unanimously elected as Delegate from this Association. The delegate was informed that the subjects to be brought forward by him at the Assembly are :—

Tea Thefts ; Kottayam Kumili Road and especially the Vandiperiyar Kumili section.

5. *Election of an Honorary Member.*—It was proposed by Mr. Leahy and seconded by Mr. Roissier : "That Mr. Atkins, the Magistrate at Peermade, be elected an Honorary Member of this Association."—*Carried unanimously.*

Appeal from the Principal of St. George's Homes, Kodaikanal.—The Chairman read a letter from the Rev. J. H. Osmaston with an appeal on behalf of this Institution.

With a vote of thanks to the Chair the Meeting terminated.

(Signed) REGINALD P. ROISSIER,
Honorary Secretary.

FEDERATED MALAY STATES.

Rubber Cultivation in 1913.

According to information received from the Malay States Information Agency in London, the Director of Agriculture for the Federated Malay States, in his report for 1913 states that the production of plantation rubber in that year was 23,719 tons against 15,506 tons in 1912. This is just over one-half the world's supply, which has been computed at 47,000 tons for 1913. The total estate production of Malaya, however, is returned at 28,214 tons, an increase of 9,266 tons, over the previous year. The largest increase outside the Federated Malay States comes from Malacca, where the production was doubled during the year, and that Settlement now follows Selangor and Perak in production.

Selangor exported 11,883 tons ; Perak, 7,659 tons : Negri Sembilan 3,995 tons and Pahang 182 tons.

The area newly planted with rubber in 1913 was only 34,127 acres as compared with 54,105 acres in 1912 and 107,200 acres in 1911.

The increase is larger than might have been expected, however, in view of the fall in the price of rubber.

The producing rubber acreage in the Federated Malay States is returned at 164,390 acres, an increase of about 28,000 acres over the preceding year. The average yield per acre works out at 275 lbs.

The fall in the price rubber, of although its rapidity was unfortunate, was not without its good effects on the plantation industry. Estates throughout the country have overhauled their expenditure, and considerable economies have been effected in all direction.—*The Board of Trade Journal.*

FERTILISERS.

The Position of the Fertiliser Supply in South India.

Mr. Bernard, Messrs. Parry & Co's chemist, has been kind enough to write the following article showing how the conditions imposed by the European War affect the supply of fertilisers in South India, This is a subject of great interest to the planters and Mr. Bernard's suggestion as to how to overcome the shortage of Potash is an excellent one. Existing conditions undoubtedly afford an excellent opportunity for developing local supplies of fertilisers and giving them a fair trial against imported materials, and if a means of supplanting German Potash can be found, why so much the better. Mr. Bernard writes as follows:—

"In these days when the question of the supply of Manures is being discussed, and the importation of Manures from Europe, especially Potash Salts, is suspended, a word or two on the position may be of interest to your readers.

"First of all, we may say there is no occasion to fear short supplies of imported manures for this season, as stocks on hand are sufficient to cover all probable requirements. If the War is not over before next season, however, it is probable that some alteration of Planters' manuring programmes will have to be considered. Germany being the source of Potash Salts, it will be impossible to import the usual grades of Sulphate of Potash, Muriate of Potash, and Kainit, and high rates of freight will add considerably to the cost of such manures as Basic Slag, Nitrolim, and those grades of Superphosphates which are imported. Here again there is no cause for concern, because all the essentials of plant-food—Phosphates, Nitrogen, Potash, and Lime are available in this country and the manuring of Tea, Coffee, & Rubber need not suffer in the slightest degree. With an ample supply of bones and Sulphuric Acid, Phosphates can be manufactured to take the place of those that have been imported. The requisities are Mills for grinding the Bones to fine meal, and plant for the manufacture of Sulphuric acid. We are already carrying on these operations on a large scale at our Ranipet Works and we command supplies of bones which are sufficient to make phosphates to supply all the needs of the Planting Districts of Southern India.

Phosphates.—The Bone compounds we refer to are: –

(1) Superphosphate containing:—

14 to 15 per cent. phosphoric acid soluble in water.

15 to 17 per cent. total phosphoric acid.

"This is suitable only for soils which contain a certain amount of Lime in their composition. It is made from bone char dust and contains little or no nitrogen.

(2) "Basic Bone Superphosphate containing:—

12 to 13 per cent. Phosphoric acid soluble in citric acid

$2\frac{1}{2}$ to 3 per cent. Nitrogen

about 40 per cent. Lime.

"The majority of soils in the Planting Districts being deficient in lime, phosphates in a basic form are, as a rule, to be preferred and we manufacture this quality accordingly. Its price at our Works is about Rs.75 per ton and having regard to its analysis and ready availability in the soil, it is a cheap manure. Taking the value of $2\frac{1}{2}$ per cent. Nitrogen to be Rs.25 per

ton Rs.50 represents the value per ton of the citrate soluble phosphoric and lime (CaO) in combination, which it contains.

"This manure may be confidently recommended to supply the basic phosphates for which basic slag is frequently used. Our product is supplied in fine pulverous condition, without which, of course, it would not be so suitable.

"*Nitrogen.*—One effect of the War is, we anticipate, that owing to the interruption of shipping from India, the price of poonac will fall, and we shall have for the time a reversal of ordinary conditions in which the unit of nitrogen can usually be bought cheaper in an imported form than in poonac. In fact, the reason for importing nitrogenous manures under normal conditions in many cases is that the market value of poonac is sometimes beyond its manurial worth; it is then advisable to use imported manures. If these should not be available, there will be ample supplies of poonac obtainable locally, so that so far as nitrogen is concerned there will be no shortage, and rates will be in favour of our planting friends.

Potash Salts.—As already mentioned, it is impossible to import further supplies of these while the war lasts, but existing stocks are likely to serve this season's requirements. In regard to their use, the quantity usually recommended by the Potash Syndicate as the maximum to apply per acre is 1 cwt. Sulphate or Muriate of Potash. We have found that an annual application of a ½ cwt. of Sulphate or Muriate of Potash per acre in a complete manure gives satisfactory results and we recommend it as an economical dose, especially in the present circumstances. We have, however, completed arrangements to manufacture, when stocks of imported Potash Salts are exhausted, *a Double Sulphate of Potash and Lime*. This, by reason of its lime contents, will be entirely suitable for the soils of the Planting Districts. Its analysis shows it to consist of fully half Sulphate of Potash and the remainder Sulphate of Lime; it contains 25 per cent. pure Potash. The cost of this double Sulphate of Potash and lime will, we anticipate, compare favourably with that of imported Sulphate of potash unit for unit."

TEA.

Indian Tea.

Offerings this week comprised about 40,000 packages, and a marked change has taken place in the condition of the market since last week. The report that no steamer with Tea left Calcutta between September 7th and October 4th caused the trade to consider the position of stocks in the near future, and this, together with the large demand for export, had the effect of forcing the market up rapidly. All grades were actively competed for at the public sales, and while the lower descriptions were fully ¼*d.* dearer, Medium Pekoes frequently showed an advance of a 1*d.* per pound. In addition to the cessation of shipments, the actual quantity "entered for export" at Calcutta and Chittagong during September only amounted to 20 million pounds, against 34 million pounds in September of last year. For next week about 47,000 packages are in type. The following are the figures for September, according to statistics prepared by the Tea Brokers Association: Imports, 27,559,000 lbs., against 28,524,000 lbs. in 1913. Deliviries, 15,285,000 lbs., against 14,902,000 lbs. in 1913, while the stocke stands at 46,429,000 lbs. compared with 45,916,000 lbs. at the corresponding period last year.—*The Produce Markets' Review.*

LABOUR DEPARTMENT.

I shall be much obliged if all subscribers of the Department will kindly note that no correspondence must take place between Proprietors, Managers, Superintendents or Assistants in charge of Estates and the Indian Agents or subordinates of the Departmental Staff. Letters should always be addressed to the European Officer in charge of the District where work has to be done. An exception is made as a temporary measure in favour of estates already in the habit of corresponding with the Trichinopoly and Villupuram Agents, copies of all such correspondence in these two instances being forwarded to me as heretofore.

(Signed) AYLMER FF. MARTIN,
Director.

Labour Department.

PLANTING CORONOR'S RECOMMENDATION CIRCULATED.

The District Planters' Association in the Nuwara Eliya District have received circulars from the Assistant Government Agent, Nuwara Eliya, regarding the recent rider added by Mr. W. Arthur Gorden to a verdict at an inquest held by him on the body of a cooly child who died as a result of being suffocated while in a cloth cradle. It is requested that Estate Superintendents might be informed. Nuwara Eliya Cor., November 3rd. —*Ceylon Times, 4th November, '14.*

WAR FUND.

The following subscriptions have been received from the Anamalai Planters' Association and acknowledged by the Honorary Secretary.

	Madras.	Imperial.	Prince of Wales.
J. I. Jones, Esq. ...	—		Rs. 50 0 0
J. H. Robinson, Esq. ...	—	50 0 0	
C. L. Dobbie, Esq. ...	—	15 0 0	
C. R. T. Congreve, Esq. ...	Rs.33 5 4	33 5 4	33 5 4
E. N. House Esq. ...	—	—	20 0 0
J. Jeffrey, Esq. ...	—	25 0 0	25 0 0
J. E. Sampson, Esq. ...	—	—	25 0 0
S. W. Hoole, Esq. ...	—	—	25 0 0
E. W. Simcock, Esq. ...	—	50 0 0	50 0 0
A. C. Cotton, Esq. ...	—	—	35 0 0
C. A. Mackenzie, Esq, ...	—	25 0 0	
J. O. K. Walsh, Esq. ...	—	—	25 0 0
R. Fowke, Esq. ...	—	50 0 0	50 0 0
J. E. Scott, Esq. ...	—	50 0 0	50 0 0
	Rs.33 5 4	Rs.298 5 4	Rs.453 5 4
From Mr. Aylmer Martin...		75 0 0	
Previously acknowledged...		1,025 0 0	
	Rs.33 5 4	Rs.1,398 5 4	Rs.453 5 4

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1913.	1914.	1913.	1914.
	lbs.	lbs.	lbs.	lbs.
For week ended Oct. 3 ...	5,787,168	5,259,691	1,548,313	1,547,847
For 40 weeks ended Oct. 3 ...	209,367,055	222,124,919	42,201,026	41,609,441

—*The Produce Markets Review.*

A SIDELIGHT ON GERMAN PRICES.

The Government exhibition of German and Austrian toys in Cheapside was well attended by members of the trade, who were impressed by the extraordinary cheapness of many of the lines.

The bulk of Germany's trade is in toys retailed at a few pence, but as England purchased £1,183,704 worth of German toys last year, it is evident their trade is worth capturing.

We have in the past been urged to imitate the Germans *ad nauseam*. Some of the revelations lately made concerning German trade show that the Teutons have occasionally surpassed themselves, attaining to a business *finesse* in which we could not possibly hope to rival them. Thus the *Evening News* cites an extraordinary exploitation of the British market in connection with a British toy invention. This was made by a German in a small way of business, who started with £3,000, borrowed from an obliging German bank.

As soon as the plant was established, the bank applied to the German Government and obtained the services of 175 convicts, who were sent down at five o'clock each morning to the works, in charge of armed guards. The workshop, in fact, became a prison factory.

The bank paid to the German Government an amount equivalent to 1*s*. 3*d*. per day for each convict, and out of this amount three halfpence went to each prisoner, to form a fund for his benefit when released. In addition to the 1*s*. 3*d*., the bank paid three halfpence a day for the maintenance of each convict. The men were taught a good trade and cost the Government nothing. Cases for the toys were made in the same factory, packed there by girls, sealed with a leaden Government seal, and sent to Hamburg for shipment—all for England. This seal was only broken after the goods left Hamburg, and the mark *in ink* upon each toy, "Made in Germany," was easily removed by the agent in this country. The toys were delivered in London to the retailers at 3*s*. 10*d*. per dozen, and were sold to the public at 6½*d*. each.

British labour for the same class of work would have been, at the current rate, from 4*s*. 9*d*. to 5*s*. 3*d*. a day.

The Deutsche Bank made all necessary trade enquiries, collected accounts, and the business was guarded in London by their own clerks. The same toy was sold in Berlin at 1*s*. 3*d*. marked "Made in England."

Obviously these methods cannot be copied here, but the enterprise might possibly suggest occupation for some of our German prisoners, who appear to be having an uncommonly good time. We commend the suggestion to the authorities!—*Export World and Commercial Intelligence.*

The methods employed in the analyses of seed on the Continent naturally vary in the different institutions, but in general the principal objects of determination are common to all. These may be summarized as follows: (1) genuineness and place of origin (the place of origin is important owing to the fact that the value of a sample of seed depends to a large extent upon where it is grown); (2) purity; (3) moisture content; (4) weight of 1,000 fresh seeds; and (5) germinating capacity and energy of germination. In the course of perusing the publication under consideration, it appears that the question of method is dealt with especially comprehensively in connexion with the Wageningen station in Holland, and it is therefore proposed to confine remarks on the subject with reference to this section.—*The Agricultural News.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents.

The Planting Expert contributes an article on the Local Deposits of Limestone to which he referred in his Annual Report of 1912, when an examination of local deposits to ascertain whether a cheaper source could be found than of shell lime from the Coast was, under investigation. The suggestion thrown out to start a co-operative scheme, in these hard times, is deserving of grave consideration by the Planting Community. A comprehensive list is given with contents and those owners of properties near these centres would do well to study the advantages. Careful advice is given as to which should be used and which should be rejected, and the difference of cost of indigenous and imported lime worked out. The whole article is so replete with sound economical advice, that, we are sure, it will be read with great interest by all.

We publish the proceedings of the General Meeting of the Wynaad Planters' Association.

As regards the Scientific Department being taken over and run by the Government of Madras, information has reached us, that the Government have decided, on account of the War, to allow the matter to rest in abeyance for at least a year, if not until its cessation.

Concluded in this issue is Mr. E. A. Andrews' interesting paper on Insects, for which we are indebted to the courtesy of the Indian Tea Association.

We continue Mr. Hall's address on "Land for Agriculture" and it will be noted what stress he lays on the presence of Calcium Carbonate in the soil, and read in conjunction with the Planting Expert's article, should lend added force to the Planting Expert's advice.

We mentioned last week that many planters were applying to be enrolled as officers in the Indian Army Reserve. Since which we have heard with pleasure that Mr. H. R. D. Bolton, a son of an old Mysore Planter, has been gazetted to the 108th Infantry at Bombay. He is an old Rossall boy and has played for Hampshire. We wish him a distinguished career.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Local Deposits of Limestone.

In my Annual Report for 1912 it was stated that an examination of the Limestone deposits from different districts in South India had been begun to ascertain whether a cheaper source of lime than that from shells at the coast could not be found for certain planting centres. A number of samples from different places have been analysed from time to time, and the results show that there are deposits of Limestone which would yield valuable supplies of agricultural lime. These need exploitation and if proper methods of burning were employed probably a good grade of lime could be made at a cheaper rate than that now paid for coast lime when cost of transport is taken into account. Coast lime is often unsatisfactory and I often have samples sent me which have been badly burned and which contain a large quantity of stones. It would appear that something might be done to develop local supplies to planting districts which are favourably situated towards local deposits of limestone. There is a difficulty in some cases of acquiring the rights to work these deposits, but this could be overcome in many cases. What is needed is a little co-operation amongst the planters of the favoured districts, but judging from past experience this is probably to be despaired of, There are many things the South India Planter cannot do, but pre-eminent among his limitations is his utter inability to combine to run any kind of co-operative scheme for his own benefit and that of his neighbours. Herein he falls a long way behind in the race of agricultural progress which is such a marked feature of modern times in other countries, and his profits suffer in consequence to a degree which he possibly does not realise.

The following are analyses of limestone deposits which have been made in my laboratory during the last three years:—

District in which deposit occurs.	Calcium Oxide.	Carbon dioxide.	Equivalent of Calcium carbonate.	Magnesium. oxide.	Insoluble matter.
1. Hunsur	48·19	39·30	86·05	3·29	7·47
	43·34	35·16	75·60	2·75	14·96
	34·84	37·42	62·18	4·74	8·48
	38·14	34·93	68·10	0·83	12·44
	49·00	38·54	87·50	0·91	3·81
	37·82	42·20	67·53	10·25	2·85
	46·22	37·46	82·54	2·11	10·39
2. Birur	51·58	38·58	92·10	0·34	1·86
3. Lingadhalli ...	47·88	38·20	85·50	0·88	5·50
4. Dod Lingadhalli ...	41·16	35·94	73·50	0·59	8·50
5. Tarikere ...	38·36	42·75	68·50	10·05	3·14
6. Hospet	41·86	32·56	74·75	0·98	12·24
7. Lecki	50·82	39·90	90·75	1·24	5·94
„	43·08	30·23	76·93	2·05	11·95
8. Salem	30·80	31·76	47·04	9·13	22·48
9. Nilgiris	45·36	36·11	81·09	1·55	13·46
„	47·88	38·25	85·50	1·36	8·24
10. High Range (Travancore) ...	46·76	20·31	46·16	—	17·84
11. West Coast Shells ...	56·76	43·72	99·57	—	0·60

Many of these would yield a high grade of agricultural lime. None are so good as the shells used as a source of lime at the coast, but some approach this source closely and would be quite good enough when the saving in transport is taken into account. Magnesia content should be looked at and any sample containing over 4% of this rejected. The sample from Salem is typical of a material useless from the planters point of view, while the Nilgiri, Lecki, and Birur samples may be taken as typical of highly suitable material. The Tarikere sample is useless on account of its high magnesia content, as are some of the Hunsur deposits, but on the otherhand, many of these latter deposits are very suitable for the mannfacture of a good agricultural Lime.

A good grade slaked lime from the coast costs Rs.20 per ton. If pure this contains about 75% Calcium oxide, *i.e.* each pound of this material costs 2'3 pies and this should be taken as the unit value. To this is to added the cost of transport to the estate, often another 10-15 Rs., and if the local deposit was near the estates, though turning out a somewhat lower grade of lime it would be cheaper to obtain it from them and apply a little more, than from the coast. For example, suppose the cost of transport to any particular estate is Rs.10 a ton—the cost of a pound of Calcium oxide obtained from the coast on the estate becomes 3'7 pies. Now suppose a local lime could be bought containing only 65% Calcium oxide, on which the transport was Rs.2 a ton. Even if the price of this lime at the kilm was still Rs.20 (which it should not be) the cost of a pound of Calcium oxide on the estate is only 2'6 pies.

To look at it in another way, if the application of the coast slaked lime was to be two tons an acre, or 3360 lbs. of Calcium oxide, this would cost Rs.60 on the estate. Now to get the same quantity with the lower grade local slaked lime, 2 tons 7 cwts. per acre must be applied, and this would cost Rs.50-9-7 on the estate.

As a matter of fact the advantage should be more than this as it should be possible to produce the lime locally at less than Rs.20 a ton. With the increasing necessity for regular applications of lime to estates in South India, where the soil is naturally deficient in this important ingredient, this matter is, as I have pointed out before, worthy of the serious attention of planters favourably situated as regards local deposits of limestone. In Assam, Tea soils have recently been found to benefit very considerably from application of lime and tea districts far from the coast would do well to investigate the possibility of sources nearer to hand.

Lime-Magnesia Ratio In Soils.

According to Loew an excess of either Lime or Magnesia in the soil is injurious to plant growth, the optimum ratio of Lime to Magnesia being 1 : 1 to 4 : 1. Experiments however to test directly the effect of this ratio on the growth of plants have given conflicting results. From the effect of salts on plants grown in water cultures we shou'd expect plants not to be influenced by the ratio of the bases under the conditions obtaining in any but alkaline soils, while from field observations it is certain that soils with an exceedingly wide ratio of Lime to Magnesia may be exceptionally fertile. Hence it would appear that in analyses of ordinary soils this ratio has not the significance which Loew accorded it. Still it is advisable not to apply large quantities of magnesia to a soil in need of Lime, and Magnesium limes should be avoided as far as possible as fertilisers.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS

Wynaad Planters' Association

Proceedings of the General Meeting held at the Meppadi Club on November 4th, 1911.

PRESENT.—Messrs. Bisset; Blackham; Darkin; Gauld; Macbain; Milton; A. R. Simpson; Vernede; Whitton; Winterbotham and C. E. Abbott, Honorary Secretary. Mr. Whitton in the Chair.

1928. *Election of New Members*.—Messrs. A. R. Simpson and J. C. Blackham were elected members.

1929. *Proceedings of last meeting* were confirmed.

1930. *Revenue Settlement in Wynaad.*—Read letter from the Hon'ble Mr. L. Buckley, I. C. S., who owing to the pressure of other work is unable at present to visit Wynaad.

1931. *Scientific Department U. P. A. S. I.*—The Honorary Secretary stated that in order to make up the sum required to enable us to accept the offer made by the Madras Government (see report in August Proceedings para. 1912, and U. P. A. S. I. Book) the Chairman proposed to utilise the U. P. A. S. I. share of the profits of the *Planters' Chronicle* during the current year. He had voted in favour of this being done.

1932. *Attesting coolies' contracts in Mysore.*—Read letter from the Postmaster-General, Madras, to the Collector of Malabar stating that it was proposed to appoint Postmasters in certain offices in Mysore to attest coolies' contracts under the Madras Planters' Labour Law and enquiring in what places Planters wished this done. Read Honorary Secretary's letter suggesting that the following Postmasters should be appointed:—Malvalli; Mysore; French Rocks; Nagamangala; Nanjengode; Narasipur; Seringapatam; Tirumakudulu Nartipur; Tumkur. Members who wish to have the names of other offices added, are asked to write to the Honorary Secretary as soon as possible. The spelling should be that given in the Postal Guide. As a rule the Postmasters in *Branch* offices will not be appointed.

1933. *Roads.*—Read letter complaining about the state of Road 38 between Chundale and Meppadi; Honorary Secretary's letter, and reply from the District Board Engineer saying that the matter had his attention. It was resolved to ask the representatives of the Association on the District Board to ascertain if the allotment on this road is considered sufficient, and if more money can be obtained. Members present complained of the state of the bridges at mile 2/3 and 7/1 on the Velleramulla Road and of the bridges Nos. 7, 8 and 9 on Road 31 Vayitri Achoor. The Honorary Secretary was instructed to address the District Board Engineer. Complaint was also made of the state of the P. W. D. road between Vayitri and Sultan's Battery.

1934. *Tea and Coffee for Troops.*—Read letter from the Secretary, U. P. A. S. I. stating that liberal contributions of tea had been sent from Ceylon and Northern India, and suggesting that the planters of S. India should also send supplies. Read Honorary Secretary's reply asking if definite information had been received that Ceylon was sending tea. A million lbs. had been offered by somebody from the Island and accepted; but the tea did not appear to be forthcoming, and the scheme had been declared impracticable. Also enquiring what kind of cases tea for troops ought to be packed in, and if coffee ought to be sent raw or roasted and ground. No reply has been received. It was decided to let the matter stand over.

1935. *Postal Delays.*—Read letter complaining about the late delivery of the mails at Perrindotty and Meppadi Post Offices, and reply from the

Superintendent of Post Offices, West Coast Division, regretting the delay and stating that steps had been taken to prevent its recurrence. The Honorary Secretary was instructed to enquire when the appointment of an Assistant at the Meppadi Post Office would be made, so as to enable the office to be kept open from 6 a.m. to 6 p.m.

1936. *Reduction of coolies' wages.*—Read letter from Chairman, Nilgiri Planters' Association forwarding one from Mr. deCourcy suggesting that an attempt should be made to reduce coolies' wages. The meeting was of opinion that considering the price of grain and other matters, the time is not opportune.

1937. *Stencilling Weights on Tea Chests.*—With reference to former Proceedings (see para. 1914) and the recommendation from the London Association of tea buyers, read letter from Messrs. Harrisons and Crosfield, Quilon, who had referred the matter to their London Board. The latter writing on August 20th, was of opinion that there is no necessity to depart from the present practice of stencilling net weights on all packages.

1938. *Liquor Shop Sites.*—Read letter from the Deputy Collector of Wynaad forwarding a list of the proposed sites for liquor shops in Wynaad, and stating that if any of the sites are found objectionable steps would be taken to alter them. The Honorary Secretary was instructed to thank the Deputy Collector and to inform him that there was no objection made to any of the sites.

1939. *Non-Bailable Warrants.*—Read letter from Secretary, U. P. A. S. I. quoting a letter from the First Assistant Resident in Mysore with reference to this Association's complaint that non-bailable warrants against coolies and maistries had been treated as bailable by the Mysore courts, stating that enquiry will be made if specific instances are given.

1940. Mr. Whitton called attention to the case of his defaulting maistry Chatapen who was arrested by the Ponani Police in August 1913 on a warrant issued by the Vayitri Magistrate. He was released on bail and ordered to appear at Vayitri on September 8th which he did. The Magistrate was in camp, and Chatapen was unable to get himself taken into custody. He again attended on September 19th and as the Magistrate was again in camp his second attempt to surrender to justice also failed. He then disappeared. After making numerous enquiries from the Court Mr. Whitton applied for another warrant which was issued on June 20th, 1914, and returned by the Sub-Inspector of Police at Chalisseri, who had previously arrested the man with the remark that the description of the accused was incorrect, that there was no such person in the Amsom, and no such Desam as he was said to reside in. The additional District Magistrate of Malabar to whom Mr. Whitton then complained said neither the Police nor the Vayitri Magistrate were to blame, and that it was all Mr. Whitton's fault for not giving a proper description of the defaulter. In reply to a subsequent letter however, Mr. Whitton has been informed that orders have been issued to the Vayitri Magistrate to make arrangements for the appearance of accused persons before him when he is in camp, and told that he ought to have proceeded against Chalapen's sureties.—*Noted.*

(Signed) N. C. WHITTON,
Chairman.

(„) C. E. ABBOTT,
Hon. Secretary.

ON INSECTS.

By E. A. Andrews.

Part II.

(*Continued*).

Mantidae—praying insects. The suggested usefulness of these insects as a means of keeping down the Tea Mosquito has brought them prominently before the notice of tea planters, and there are probably few, if any, who could not recognise one at sight. The head, as in cockroaches, is bent down, and somewhat backward, and, seen from the front, is triangular in form, with the apex of the triangle below. At each upper cover is a large compound eye, and between these are three ocelli, arranged in a triangle with the apex below. The antennae, which are, as a rule, slender, are situated between the eyes and the ocelli. The head is attached to the thorax by a very slender neck, which is exceedingly mobile. The pronotum is largely developed, and the first segment of the thorax longer than the other two. The front wings take the form of wing-covers, and the hind wings, which are much larger, are folded beneath them, in repose, in a fan-like manner. The structure of the front pair of legs is peculiar. The basal joint, or coxa, is long, and the femur and tibia are provided, on the under surface, with large spines, and are so arranged that the tibia can be folded completely back upon the femur to form an exceedingly efficient grasping organ. These legs are situated at the front end of the first thoracic segment, and it is easy to understand how the lengthening, and the position of the latter upon the former, give greater mobility to and increase the range of motion of the legs. In repose the coxae are directed forward, and the femur and tibiae (closed one upon the other) vertically upward, which habit is responsible for the popular name of these insects. The other two pairs of legs are simple. The abdomen is usually long, with a pair of ringed " cerci " or appendages, at the hind end.

The eggs of Mantidae are laid in a symmetrical manner in an eggcase. This is not, as might, perhaps, be imagined, formed first, and the eggs deposited therein, but the eggs come out of the female inside a frothy mass, which solidifies, and in the process of solidification forms a series of cells in which the eggs are contained. The eggs deposited last hatch first. The form taken by the egg-case varies, but the most common varieties on tea are a pea-shaped case on the stems, and a short cylindrical case, which stands on its side on the upper surface of a leaf. Both are whitish in appearance. One female may construct several cases. After about three weeks, in this part of the world, the eggs hatch, and the young emerge and fall from the case. They do not fall to the ground, however, but hang from the case by a thread until they have undergone their first moult. After this moult they wander about in search of food, and when they have undergone seven or eight moults become adult. The first stage during which the insect remains suspended from the egg-case, bears little or no resemblance to the adult, but all the succeeding stages have the typical Mantis appearance. The metamorphosis is therefore incomplete, and yet more complete than in cockroaches. Mantis insects are carnivorous, and will eat most insects which come their way, even if opportunity offer, one of their own kind.

Phasmidae—leaf, and stick insects—are found occasionally in the tea districts, but are of no importance as pests of tea. They differ from the Mantidae in that the middle thoracic segment is very elongate, and the first thoracic segment short, but as the second pair of legs is situated at the hind

end of the segment, the first and second pairs of legs are widely separated as in Mantidae. The six legs are but little different from one another; the first pair not being modified for grasping, and the posterior abdominal appendages are unjointed. The members of this family exhibit extraordinary variations in shape and form. Some species resemble pieces of dried-up twig, whilst others, of which the Leaf Insect found in the tea districts of Cachar and Sylhet is a notable example, bear a most marvellous resemblance to leaves. Even the eggs are very difficult to distinguish, in many cases, from seeds, and as the female drops them upon the ground beneath the tree in which she sits, they are scattered about just as seeds, would be, which makes them still more difficult to detect. The life histories of the members of this family are not very well known. The eggs often take two years to hatch. The Leaf Insect of Sylhet (*Phyllium seythe*) takes over a year to become adult, and undergoes three moults. The first two stages are wingless. After the second moult the wings being to appear, and at the third moult the winged adult emerges. In some parts of the world Phasmidae are injurious, one species being recorded as injurious to cocoanut trees in the Fiji Islands.

Acridudae—short-horned grasshoppers and locusts—have the hind legs developed for leaping. The body is compressed at the sides, and the wings when at rest fit closely to the body. The head is, as a rule, large, merging into the thorax behind, with large eyes and short antennae. There are three ocelli. These insects make a chirping sound by rubbing the outside of the front wing against the femur, or thigh, of the hind leg. On the inside of the thigh is a series of minute knobs, and on the outside of the front wing is a ridge. The latter is set in vibration by being drawn over the knobs. The action of the apparatus may be compared to that of a wooden rattle, in which a wooden vane has the free end impinging on a cogwheel. The vane is made to revolve round the wheel, and a rattling sound is thus produced. At the front of the abdomen is a peculiar structure which is supposed to be an auditory organ, so that members of this family may be said to have their ears on the abdomen. The eggs are laid in batches in holes made in the ground, and hatch out after a month or six weeks. There are six or seven moults, the insect, at each moult, becoming, more like the adult. The wings appear at the first to third moult, and show a greater development at each subsequent change of skin. From the beginning of September the adults begin to appear. The male dies soon after copulation, and the female soon after depositing her eggs. The members of this family are vegetarian. Swarms of locusts have been recorded in certain tea districts, but they are unusual. Grasshoppers of various kinds are common, but on the whole seem to prefer the jungle to tea. Should grasshoppers be suspected of doing harm in a nursery, the young plants might be sprayed with the following mixture:—

Lead arseniate	...	...	1 lb.
Jaggery ..	...	...	5 lbs.
Water ...	...	...	100 gallons.

Locustidae—long-horned grasshoppers—are easily distinguished from Acridudae by their long antennae, although in other respects there is often a great resemblance. These insects also possess organs for the production of sound, and auditory organs, but they are not in the same positions on the insect as in the preceding family. Here the chirping is produced by rubbing the edge of one of the front wings against the other, which is provided with a series of tiny ridges, similar to those on a file, whilst the "ears" are on the front legs. The eggs of

species of this family are laid in different places. Some lay their eggs in the ground, others on twigs or stems of plants. Sometimes a twig on a tea bush may be seen to have two rows of small eggs, laid in contact with one another, and parallel to the length of the twig. These are the eggs of a species of Locustidae. Just before hatching the eggs swell up and become larger, and the insect curtails its life history somewhat by undergoing its first moult as it emerges from the egg. There are altogether five moults, including the one mentioned. Locustidae are not exclusively vegetarian. Many are entirely carnivorous.

Gryllidae—crickets—are strong, thickset insects, of a brown colour, with a large head and long slender antennae. The head is deflected downwards and has imperfect ocelli. The front wings act as covers for the hind wings, and at rest lie close to the body, one overlapping the other, and deflexed at the sides to fit closely to the body there. There are very long unjointed cerci at the hind end. In Gryllidae, as in Locustidae, the organs for producing sound are situated on the front wings, and are similar in structure, but instead of the file arrangement being on one wing only it is present on both. The hearing organs are on the front legs. The life history, as in all other Orthoptera, is accompanied by very little change in form. The eggs are laid in clusters at the bottom of burrows in the ground, which may be a foot or more in depth, in September—October. These eggs are about a fifth of an inch long, and cylindrical in shape. In clusters laid in captivity about forty eggs were found, but dissection of the female shows as many as a hundred and fifty eggs to be present at once. The eggs take about a month to hatch, and the insect becomes adult in about eight months, having in the meantime undergone five moults. After the second moult the wings begin to show, and after the third they are distinctly visible, but otherwise there is very little change in appearance, beyond in size, throughout the whole life history. When the young first hatch they stay in the burrow, but after a few days they emerge and begin to feed, and dig burrows for themselves. At first the burrows are small, and the young cricket emerges from one burrow to feed, at night, and instead of returning to the same burrow digs another one. As the insect becomes older it burrows deeper, and eventually sticks to one home. The cricket's method of feeding is only too well known to the tea planter, who find the tops of his seedlings cut off morning after morning, and dragged down into the burrows to be devoured at leisure. The damage done by crickets is not confined to tea, however. Jute, indigo, and rice are often seriously affected by them, as well as many other plants.

Although the cricket is of such importance as a pest, he has many enemies. When he is roaming about at night he is preyed on by owls and bats, and it is no uncommon thing to find one's verandah strewn with the legs of luckless individuals which have come to the light and encountered a bat. Rain drives them from their burrows, and when this happens large numbers of them fall a prey to birds. The Digger Wasp must be responsible for quite an appreciable depletion in their numbers, and ants may be often seen dragging a cricket to their nest. The latter seem to have a wonderful power of scenting one which has just moulted, and whose soft skin renders him less formidable.

Many remedies have been suggested for dealing with crickets, and on most gardens they are caught by children. Pouring water, kerosine, etc., down their holes has been suggested. This is quite as expensive as catching in the ordinary way, and probably quite as tedious. Also, as the burrows often have ramifications, and perhaps other openings to the surface, the cricket may not emerge at all. It seems practicable, however, in the case

of a nursery, to flood it for a short time, say half a day, for then water would enter at all the holes. A few boys could then make short work of the insects which emerged. Another method for dealing with such pests is by means of poisoned bait. Lefroy's formula, *viz*:—

Husks of rice	...	...	... 1 md.
White arsenic	...	...	... 1 seer.
Gur ...	...	...	... 2 seers.

Water to make a paste was used on a nursery bed at Tocklai, in which the tops of the seedlings were being eaten off, and although the bait was not applied, in the first instance, to keep away crickets, it was observed that no more seedlings were eaten, whereas there were crickets about. The bait was scattered in a ring round each seedling.

The Mole Cricket, easily recognisable by the greatly developed front legs, also occurs in the tea districts, and probably does a certain amount of damage by cutting roots, etc. As he works underground his depredations are not so noticeable.—*The Quarterly Journal of the Scientific Department of the Indian Tea Association.*

Coir Fibre.

We have on several occasions pointed out that hundreds, possibly thousands, of tons of valuable fibre are allowed to rot in heaps in many of the British Colonies, and we instanced the enormous quantity of coconut husks which are allowed to go to waste in Papua, where copra is produced in several districts on the coast. Coir fibre is extensively used for cordage, stair carpets, matting, bristles for brushes, brooms, &c., and when cleaned and curled, it is largely used by upholsterers for stuffing mattresses, &c. The quantity of fibre contained in a husk varies very much according to climate, season, and place of growth. In Ceylon, forty coconuts are said to yield 6 lb. of coir fibre. Three large nuts will yield 1 lb. It is ordinarily assumed that, on an average 1,000 nuts will yield 140 to 160 lb. of fibre. Say it takes 5,000 nuts to produce 1 ton of copra. This means that from 700 to 800 lb. of fibre are wasted in many copra-producing countries for every ton of copra produced. As clean coir is worth £18 to £20 per ton in the market this represents a loss, less expenses of preparation, of between £6 and £7 for fibre now going to waste. In order to remove the husk from the nut, an iron spike is fixed in the ground; the nut is forced upon its point which passes through the fibres, and separates the husk from the shell. But this primitive native method, by which a man can clean about 500 nuts in a long day, has been improved upon by the invention of a machine which quickly removes the husk, enables the operator to clean 100 nuts an hour with very slight personal exertion. The machine was described in the May issue of the "Journal," 1913. The illustration shows the simplicity of the machine.

After husking, the husks are soaked in water for about six months, after which they are rolled in a crushing mill. Then they undergo the process of extracting the fibre from the husk by means of another machine called "The Extractor." Then the fibre is dried, passed over small combs or hackles to straighten it, and finally packed in bales for market. This coarse fibre, which is used for brush-making, is passed for finer work through other machines, which free it from "shorts," "hards," and other extraneous matter. Thus cleaned, it is ready for the spinning machine for the making of rope, &c. The husking machine costs in Europe about £13.—*The Queensland Agricultural Journal.*

LAND FOR AGRICULTURE.

The Australian Meeting of the British Association.

Section M.

AGRICULTURE.

Address by A. D. Hall, M.A., F.R.S., President of the Section.

(*Continued.*)

I have shown that the accumulation of fertility in grass-land left to itself and neither grazed nor mown, so that virgin conditions were being re-established, was due to the action of the organism called Azotobacter, which fixes free nitrogen from the atmosphere, and was indirectly determined by the presence of calcium carbonate in the soil, without which the Azotobacter cannot function. Examination of typical examples of black soils from all parts of the world, the prairies of North America, the steppes of Russia and the Argentine, New Zealand and Indian soils, showed in all of them the Azotobacter organism and a working proportion of carbonate of lime. Now, as we know all virgin soils are not rich, and only in a few parts of the world are to be found those wonderful black soils that are often several feet in depth and contain 10 to 20 per cent. of organic matter and 3 to 5 parts per thousand of nitrogen. These soils are all calcareous, they occur in regions of a moderate rainfall inducing grass-steppe or bush conditions, and the annual fall of vegetation provides the organic matter which the Azotobacter requires as a source of energy in order to fix nitrogen. Non calcareous soils under similar climatic conditions do not accumulate nitrogen and become rich; in the absence of carbonate of lime the nitrogen-fixing organisms are not active, and the soil only receives from the annual fall of vegetation the nitrogen that was originally taken from it. There is but a a cyclic movement of nitrogen from the soil to the plant and back again, whereas in the calcareous soils there is also continuous addition of fresh nitrogen derived from the atmosphere, in which process the carbonaceous part of the annual crops supplies the motive power.

The other leading case to be found at Rothamsted is that of certain grass-plots which have artificially been brought into an acid condition by the continued application of sulphate of ammonia. In these soils, nitrification is suspended, the nitrification organisms have even disappeared, though the herbage still obtains nitrogen because most plants are able to utilise ammoniacal nitrogen as well as nitrates. The interesting feature, however, is that the decaying grass on these acid soils passes into the form of peat, a layer of which is forming upon the surface of the soil, though nothing of the kind is found on adjacent plots where the use of lime or of alkaline manures has prevented the development of acidity. From this we may learn that the development of a surface layer of peat, independent of waterlogging (when another kind of peat forms even under alkaline conditions,) is determined by the acidity of the soil, when certain of the bacterial-processes of decay are replaced by changes due to micro-fungi which do not carry the breaking-down of organic matter to the destructive stage. This affords us a clue to the origin of many areas of upland peat in the British Isles, where the remains of ancient forest roots and stumps of trees are found on the tree soils surface below the layer of peat, but where there is no water-logging to bring about the death of the trees and the formation of peat. We may suppose that when the land surface became fit for vegetation at the close of the glacial epoch it covered itself with a normal vegetation, chiefly dwarf forest, because of the rainfall and temperature. The soil, however, being without carbonate of lime,

would in time become acid with the products of decay of the vegetable matter falling to the ground, and as soon as this acid condition was set up peat would begin to form from the grassy surface vegetation. The process would continue until the acid conditions and the depth of the accumulating layer of of peat would kill the trees, the stumps of which would remain sealed up below the peat. I am far from thinking that this explantion is complete, but at least we have facts in sight which could lead one to suppese that a non-calcareous soil originally neutral and carrying a normal vegetation can naturally become acid after the character of its vegetation and clothe itself with a layer of peat. The point of economic importance is that these peaty acid soils are of very little value at long as they are acid, though they take on a quite different aspect if they are limed and made neutral.

Of all the soil factors making for fertility I should put lime the first: upon its presence depend both the processes which produce available plant food in quantities adequate for co-production at a high level and those which naturally regenerate and maintain the resources of the soil; it is, moreover, the factor which is most easily under the control of the agriculturist,

I need say little about those cases in which infertility is due to the presence in the soil of some substance which is actually injurious to plant-growth, physical environment of the soil, to too much or too little water. In waterlogged situations we may find in the soil peaty acids, iron salts, sulphides, etc., inhibiting the growth of plants; in arid regions the soil may still be charged with an excess of soluble compounds of the alkalis and alkaline earths, resulting from the decomposition of the rocks that have been broken down to form the soil, but which through the inadequate rainfall have never been washed out. The establishment of normal conditions of growth, irrigation in one case, drainage in the other, will speedily result in the removal of the deleterious substances. Practically, only bodies that are soluble can get into a plant to injure it, hence such bodies can be removed from the soil by water, provided that the water can find its way through the soil and escape.

Let us now consider the various methods by which land suffering from one or other of the disabilities we have just discussed is now-a-days being brought into cultivation. The most important, if we consider the area affected, is the extension of cropping into regions of a deficient rainfall by means of what has been termed dry-farming. So far as its immediate methods go, dry-farming consists in nothing more than the application of the principles of husbandry worked out by English farmers in the east and south-east of England, principles first expounded by Jethro Tull, though a complete explanation was not then possible, even if it is now. In the first place, the tilth must be made both deep and fine, thus whatever rain falls will be absorbed and the conditions favouring a deep and full root range will have been established. Next, the soil below the surface, though finely worked, must be compact, because only thus can the water present travel to the roots of the plant. Lastly, a loose layer must be maintained on the surface, which, though dry itself, acts as a screen and a barrier to prevent loss of water from the effective soil below by any other channel than that of the plant. Granted these methods of cultivation, the new feature about "dry-farming," which has been introducted by settlers in the arid districts of Australia and North America, is the use of a year of bare fallow in which to accumulate a supply of water for the next year's or two years' crop. This raises the fundamental question of how much water is necessary for the growth of an ordinary crop. The first

investigation that Lawes and Gilbert carried out at Rothamsted dealt with this very point ; they grew the usual field crops in pots, protected the surface of the soil from evaporation so that all the loss of water proceeded through the plant, weighed the water that was supplied from time to time, and finally weighed the produce, expressing their results as a ratio between the dry matter produced and the water transpired by the plant. These experiments have been repeated under different climatic conditions by Hellriegel in Hidelberg, by Wollny in Vienna, by King and others in America. Now the two processes in the plant, carbon assimilation and transpiration, are not causally connected, though, as both are carried out in the leaf and have some factors in common, they are found to show some constancy in their relative magnitudes. Lawes and Gilbert obtained a ratio of about 300 lb. of water transpired for each pound of dry matter harvested, but the other investigators under more arid conditions found much higher figures, up to 500, and even 700 to 1. Now, a crop yielding 20 bushels of wheat per acre will contain about a ton of dry matter per acre, so that, taking the high ratio of 500 to 1, no more than 500 tons of water per acre or 5 in. of rain will have been consumed in the production of this crop.

It is, of course, impossible to ensure that all the rain falling within a year shall be saved for the crop ; much must evaporate before it reaches the sub-soil where it can be stored, and only when ths crop is in full possession of the land can we expect that all the water leaving the soil shall go through the crop. What proportion the waste bears to that which is utilised will depend not only on the degree of cultivation, but upon the season at which the fall occurs ; summer showers, for example, that do not penetrate more than a few inches below the surface will be dissipated without any useful effect. When the climatic conditions result in precipitation during the winter, the water will be in the main available for crop-production; and it has been found by experience that cereals can be profitably grown with as small a rainfall as 12 in. The necessary cultural operations consist in producing such a rough surface as will ensure the water getting into the subsoil ; hence autumn ploughing is desirable. Where the precipitation is largely in the form of snow, a broken surface also helps both to absorb the thawing snow and to prevent it being swept into the gullies and hollow places by the wind. On some of the Russian steppes it has become customary to leave a long stubble in order to entangle as much snow as possible, but probably a rough ploughing before the snowfall would be even more effective. When the rainfall drops to the region of 12 to 16 in., and occurs during the summer months, then dry-farming methods and the summer fallow become of the first importance. The deep cultivation ensures that the water gets quickly down to the subsoil away from danger of evaporation, and the immediate renewal of a loose surface tilth is essential in order to conserve what has thus been gained.

In connection with this dry-farming there are several matters that still require investigation before we can decide what is the minimum rainfall on which cultivation can be profitable. In the first place, we are only imperfectly informed as to the relation between rainfall and evaporation. At Rothamsted there are three drain-gauges, side by side, the soil layers being 20,40 and 60 in. deep respectively. The surface is kept rough and free from growth, though scarcely in the condition of looseness that could be described as a soil mulch. Yet the evaporation, even under a moist English atmosphere, amounts to one-half of the annual rainfall, and the significant thing is that the evaporation is approximately the same from all the gauges and is independent of the depth of the sub-soil within which water is stored. Evaporation then would seem to be determined by surface alone, but we

are without systematic experiments to show how variations in the surface induced by cultivation will alter the rate of evaporation. A knowledge of the evaporation factor would then inform us of what proportion of the rainfall reaches the sub-soil; we then want to know to what extent it can be recovered, and how far it may sink beyond the reach of the crop. It is commonly supposed that the sub-soil below the actual range of the roots of the crop may still return water by capillarity to the higher levels that are being depleted, the deeper sub-soil thus acting as a kind of regulating reservoir absorbing rain in times of excess and returning it when the need arises. But some work of Leather's in India and Alway's on the great plains of North America throw doubt on this view, and would suggest that only the layer traversed by roots, say, down to a depth of 6 feet can supply water to the crop; the water movements from the deeper layers due to capillarity being too slow to be of much effect in the maintenance of the plant. The evidence on either side is far from being conclusive, and more experiment is very desirable.

It would also be valuable to know how far evaporation from the bare soil can be checked by suitable screens or hedges that will break the sweep of the wind across the land. In England hedges have always been looked at from the point of view of shelter for stock; we find them most developed in the grazing districts of the west, while bare, open fields prevail in the east and south. Yet the enormous value of a wind-screen to vegetation can be readily observed, and the market-gardeners both in England and the still dryer districts of the South of France make great use of them. Lastly, we must have more knowledge about the relation between transpiration-water and growth; we do not know if the high ratios we have spoken of hold for all plants. Xerophytic plants are supposed to be possessed of protective devices to reduce loss of water. Are they merely effective in preserving the plant from destruction during the fierce isolation and drying it receives? and do they enable a plant to make more growth on a given amount of water? Wheat, for example, puts on its glaucous, waxy bloom under dry conditions: Is this really accompanied by a lower rate of transpiration per unit surface of leaf? and is it more than defensive, connoting a better utilisation of the water the plant evaporates?

The cultivation of these soils with a minimum rainfall necessitates varieties of plants making a large ratio of dry matter to water transpired, and also with a high ratio between the useful and non-useful parts of the plant. Mr. Beaven has shown that the difference in the yields of various barleys under similar conditions in England are due to differences in their migration factors; the same amount of dry matter is produced by all, but some will convert 50 per cent. and others only 45 per cent. into grain. This migration ratio, as may be seen by the relation between corn and straw on the plots at Rothamsted, is greatly affected by season; nevertheless, Mr. Beaven's work indicates that under parallel conditions it is a congenital characteristic of the variety, and therefore one that can be raised by the efforts of the plant-breeder. The needs of dry-land farming call for special attention on the part of the breeder to these two ratios of transpiration and migration.

(To be continued.)

Bulletin No. 11 of the Department of Agriculture, Ceylon, deals with the import of manures into that colony. It is interesting to observe that most of the nitrate of potash used is imported from India, the import in 1908 being 287 tons of the refuse salt-petre, valued at Rs.200 per ton. This has increased to 2,082 tons in 1912-13 valued at Rs.208 per ton. Sulphate of potash has also increased and in 1912-13, 5,082 tons were imported valued at Rs.145 per ton.—*The Agricultural News.*

How to take Samples and send Specimens for Examination.

Soils.

To obtain a fair average sample of the soil in a field for analysis, as nearly as possible equal quantities of soil are taken from not less than, four different parts of it. At the places chosen for taking samples the surface is lightly scraped, to remove leaves, mulch, &c., a vertical hole 18 inches square is then dug to a depth of 2 feet, like a port hole. With a sharp spade a slice of soil to a depth of one foot is cut off one side of the hole and placed in a clean bag. Big stones and big roots should be removed, but not small stones, the size of a pea, or fine roots.

The process is repeated at the other places selected, and all the samples are then thoroughly mixed, big lumps being broken up. After well mixing about 10 lbs. is placed in a clean canvas bag, which is securely tied up. Such samples should be forwarded in a clean wooden box.

It is important that bags and boxes should be clean.

Care must be taken about the labels. Each sample should be labelled, and a duplicate label put inside the bag. Full information should be sent about each sample, stating elevation, rainfall, depth of soil, nature of sub-soil, surrounding rocks and country, whether it is on a level or slope near a river, &c, and the history of the previous manurial treatment of the soil.

The same rules apply to taking samples of a sub-soil.

Plant Diseases.

These should be packed so that, if possible, they will arrive in the same condition in which they were collected, and they *must not be externally wet* when they are put up. In some cases the specimens may be dried between sheets of blotting paper under light pressure before they are packed.

Specimens which decay rapidly may be sent in a solution of Formalin, 1 part to 20 parts of water.

Insects.

If live insects are sent, some of their food plant, which should be *dry*, should be enclosed with them, and also a little crushed paper. Insects found in soil, wood, &c., should be sent in these materials.

Tin boxes should be used for packing, and holes should not be bored in them, or if they are, only one or two and these quite small.

Insects should usually be sent dead. They may be killed in a cyanide bottle, or enclosed under a tumbler with a small piece of blotting paper soaked in benzine. They should be *quite dry* when packed, and are best buried in dry sawdust with a little powdered naphthaline.

Small insects should be packed with finely shredded paper. *Cotton wool should never be used.*

Butterflies and moths should be enclosed in papers folded into triangular-shaped packets, which are packed in a box with crushed paper to prevent shaking.

Scale insects should be packed *quite dry*, each specimen attached to its food plant, simply wrapped in soft tissue paper.

General.

In all cases more than one specimen of each kind should be sent—if possible 4 or 5.

Every specimen should be clearly labelled so that there can be no possible mistake. The label should bear a number referring to a description in the covering letter.

Full particulars about all specimens sent must be recorded.

All specimens should be sent to

THE SECRETARY,

The United Planters' Association of Southern India,

BANGALORE

to ensure their being promptly attended to upon arrival.

The Planters' Chronicle.

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(INCORPORATED.)

Contents.

The Scientific Department publishes an article on substitutes for Acetic Acid for coagulating latex and gives a list taken from the *Ceylon Observer*. The question of making a cheaper substitute than Acetic Acid is noted. A new source Phosphatic Fertiliser is commented on, and an experiment from St. Lucia on Stump Rot confirms what has been advocated by the Planting Expert for some years past.

The Proceedings of a General Meeting of the South Travancore Planters' Association are published.

The Labour Department issues a note of thanks to those gentlemen who have already answered the questions of the Director, and hopes that those who have not done so, will do so, as the information gained is of the greatest assistance to him.

Mr. Prince, Labour Superintendent of Nagercoil, will be absent on one month's leave from December 9th. His clerk will be in charge of routine matters during that time.

Concluded in this issue is the valuable and interesting address of Mr. A. D. Hall at the Australian Meeting of the British Association.

From *Grenier's Rubber News* we are able to publish the statistics of the numbers of coolies employed in the F. M. S. up to December 31st, 1913. It will be noticed that there were nearly 17 times more Indians than Chinese on the Estates.

We publish an article on the use of Dynamite in Agriculture and draw attention to the plots and the girth of measurement both before and after the experiment

The article on the Commercial Aspect of Coffee is concluded and the whole is interesting, especially the para dealing with Roasting, &c., and the last para.

By an unfortunate omission on the part of the printers Mr. Hatton Robinson's Donation of Rs.50 to the Prince of Wales Fund and Mr. Dobbie's Rs.50 to the same fund were left out.

		FUNDS.		
		Madras Fund.	Imperial Relief Fund.	Prince of Wales Fund.
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SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Substitutes for Acetic Acid for Coagulating Latex.

At a meeting of the Ceylon Agricultural Experiments Committee held recently some interesting information was given about the work which has been done with rubber coagulants. The following account of this is taken from the report of the meeting published in the *Ceylon Observer* (*Weekly Edition.*)

Toddy Vinegar.—In the Agricultural Department laboratory the proportion found to be satisfactory was 3 oz. vinegar to 1 gallon of latex containing 3 lbs. dry rubber per gallon. This coagulation was slow however. When 4 oz. of vinegar were used coagulation was complete in two hours. 3 oz. of vinegar is equal to 27 gallons per ton of rubber and cost Rs.30 as compared with one gallon of Acetic acid costing 1*s.* 6*d.* per pint, or Rs.15 per ton of rubber.

Coconut Water.—Experiments with this coagulant were carried out on an estate. The water from coconuts broken for copra was collected and left in a chatty for four days. The nuts had probably been only stored about three weeks before breaking. Active fermentation took place and the liquid became markedly acid to the taste. The chatties were not closed so that the gases resulting from the fermentation could escape. The liquid was used on the fourth and fifth days after collecting; apparently it becomes less acid if kept longer than this, but this point needs further investigation. 2 oz. of the liquid were added to 2 oz. of pure latex, no water being added. Coagulation was complete in an hour. The results of investigation by the Agricultural Department with this coagulant showed that one part would coagulate about six parts of latex.

Pure Cold Water.—With every 25 parts by volume of latex one part of pure cold water was mixed, the whole being left 24 hours for coagulation.

Acetic Acid, control for comparison with the above methods. One part of commercial acetic acid was mixed before using with three parts of water. Of this diluted solution one part by volume is needed for 240 volumes of latex, coagulation taking place in two hours.

In many of the above cases Sodium bisulphite have been used. 4 oz. dissolved in six bottles of water were added at the rate of 1/16 of a bottle to every 5 gallons of latex.

It would appear that ample supplies of Acetic Acid are now forthcoming from England, but at the same time the question of making cheaper substitutes is important.

A New Source of Phosphatic Fertiliser.

Through the kindness of Mr. W. H. Reed I have recently received a sample of finely ground basic phosphate as manufactured by the Egyptian Phosphates Co. Ltd., Glasgow and Sofaga. According to an analysis made by Bamber this material contains 30% total phosphoric acid, 10% being soluble in citric acid, and so immediately available. An analysis made in my laboratory gave figures closely agreeing with these. The price is, I understand, Rs. 60 per ton f. o. r. Madras.

Good Basic Slag contains about 20% total phosphoric acid, 13'5% being soluble in citric acid, and costs Rs. 60 per ton; while Basic Superphosphate contains 14% total phosphoric acid, 12% being soluble in citric acid, and also costs Rs. 60 per ton. If we consider the phosphoric acid not soluble in citric acid to be worth only half that which is soluble, (the usual custom) we

get the following figures for the cost of a pound of Phosphoric Acid in these three fertilisers:—

	As.	p.
Egyptian phosphate	2	2
Basic Slag	2	7
Basic Superphosphate	3	3½

Hence it is worth buying at this price, being a little cheaper than Basic Slag, but it should be bought only with a guarantee.

The great value of Basic Superphosphate is its ready availability to the plant, nearly all the phosphoric acid in it being citrate soluble. On soils containing little Lime this is an advantage, as Phosphoric acid not used rapidly by the plant is apt to become locked up as insoluble Iron and Aluminium phosphates.

One of the cheapest forms of phosphatic fertiliser on the Indian market at present is Basic Bone Superphosphate which contains 2½ to 3% of Nitrogen as well as 17% of Phosphoric Acid, 13% being citrate soluble. If the Nitrogen content is allowed for at the rate of 7 as. 7 p. per pound, its cost when bought as Ground Nut Poonac, a pound of Phosphoric acid in this form of fertiliser costs 2 as. 3½ pies.

Stump Rot.

In the *Annual Report* 1913-14 *of the St. Lucia Agricultural Department (British West Indies)* some experimental work with the methods of controlling the disease of Cacao caused by a species of *Rosellinia* fungus are reported. The results obtained are of interest to the South Indian planter since root diseases of Coffee, Tea, and Rubber, locally known as "stump rot" do a great deal of damage on some estates and are a constant source of trouble. There are probably several fungi which cause these diseases here, but *Rosellinia* is a well known Tea root disease in Ceylon, and our experience has shown that the results obtained in St. Lucia apply to all root diseases caused by fungi which live and spread in the soil.

An experiment in St. Lucia "conclusively proved that the fungus can live on large pieces of cut branches such as are commonly found throughout Cacao fields after pruning the shade trees, etc." This shows the necessity in the case of this disease for collecting and destroying all dead wood in the infected fields. I have seen the disease spread along a dead tree trunk lying on the ground and the Coffee trees on each side of it die one after another in regular succession down the rows with all the typical and well-known symptoms of Stump Rot.

Again an experiment to test the curative powers of a fungicide known as "Fungal" showed that it was quite useless for the purpose of either curing it or stopping its spread. All attempts to find a cure of a similar nature in South India have likewise failed. In conclusion the Mycologist on the staff of the Imperial Department of Agriculture in the West Indies reporting on these St. Lucia experiments says, "continued experience with this disease confirms the knowledge that the only practical way known at present to deal with this disease is to surround the infected area with a deep isolation trench, thoroughly liming the infected soil, and burning the diseased wood on the spot." This is the treatment which has been recommended by the Scientific Department of the U.P.A.S.I. for the last three or four years and it is valuable to have it confirmed in this way by work and advice from the West Indies.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

South Travancore Planters' Association.

Proceedings of the General Meeting held at the Quilon Club, on Saturday, 14th November, 1914, at 10-30 a. m.

PRESENT.—Messrs. L. G. Knight (Chairman), A. Mackie, A. W. Leslie, R. J. A. Moore, J. R. N. Pryde, R. Ross, A. Marten, T. P. M. Alexander (Honorary Secretary) and Captain Ross and J. Mackie (Visitors.)

The minutes of the last meeting were read and passed.

War Subscriptions.—Proposed that the disposal of funds be left to the Committee. A list of the members who are contributing a day's pay monthly to the war funds was read out. The September subscription has been forwarded to the Prince of Wales Fund, the October subscription has been paid to the Belgian Relief Fund and a sum of Rupees two hundred and fifty—Rs.250—was handed to a member of the Association going Home to enlist.

Godowns at Punalur and Tenmalai Stations.—Proposed that the Honorary Secretary be asked to write to the Agent of the S. I. R., enclosing copies of previous correspondence on the subject, pointing out that the present godown accommodation at these Stations is insufficient, and consequently the chests of tea and rubber are liable to deterioration, and request him to consider the erection of further godown accommodation.

Loss of late Minute Book.—Mr. Seymour's explanation was read out at the meeting and his good intentions accepted.

Honorary Secretary's pay.—Proposed by Mr. Alexander and seconded by Mr. Leslie that the Honorary Secretary's pay be reduced to Rs.25 a month.

European Wards in Quilon and Trivandrum.—Proposed that the Honorary Secretary write to the Chief Secretary to the Government a copy of Mr. Valentine's resolution and request that he would be good enough to receive a Deputation of Europeans living in the State.

Gift of Tea to Russian Troops.—Mr. Valentine's letter was read, but as the Superintendents present had no authority to vote away tea, the matter was left over till it was seen if the proposal was likely to catch on when they agree to put the matter before their Proprietors.

Gun and Game Licences.—The Assistant Resident Capt. Ross, who was a visitor at the meeting, very kindly consented to explain all the points in these regulations, which members have been unable to understand for the last two years.

Capt. Ross, having made all doubtful points quite clear, was very cordially thanked by the meeting.

(Sd.) T. P. M. ALEXANDER, *Hon. Secretary.*

LABOUR DEPARTMENT.

The Director of the Labour Department desires to thank all those gentlemen who kindly took the trouble to answer the first list of questions he sent out, and to fill in the form which accompanied the list. He requests all those who have not yet given the matter their attention, kindly to do so as soon as possible.

The tables now being prepared by the Deputy Director will be closed definitely on the 15th December and if they are then incomplete, the organisation of the Department will suffer to the extent by which our information falls short of what is required.

The answers to the questions and the form to be filled up are of equal importance.

LAND FOR AGRICULTURE.

The Australian Meeting of the British Association.

Section M.

AGRICULTURE.

Address by A. D. Hall, M.A., F.R.S., President of the Section.

(*Concluded.*)

Closely linked up with the problems of dry-land farming are those which arise in arid climates from the use of irrigation water on land which is either impregnated with alkaline salts to begin with or develops such a condition after irrigation has been practised for some time. The history of irrigation farming is full of disappointments due to the rise of salts from the subsoil and the subsequent sterility of the land, but the conditions are fully understood, and there is no longer any excuse for the disasters which have overtaken the pioneers of irrigation in almost every country. Sterility may arise from two causes—overmuch water, which brings the water-table so close to the surface that the plants' roots may be asphyxiated, or the accumulation by evaporation of the soluble salts in the surface layer until plants refuse to grow. The annual cutting off of the cotton crop in Egypt, as the water-table rises with the advance of the Nile flood, affords a good example of asphyxiation, but in the neighbourhood of irrigation canals we also find many examples of sterility due both to the high water-table and an accompanying rise of salts. The governing principle is that drainage must accompany irrigation. Even if free from salts at the outset, the land must accumulate them by the mere evaporation of natural waters, and they will rise to the surface where they exert their worst effect upon vegetation, unless from time to time there is actual washing through the soil and removal of the water charged with salt. Without drainage the greater the quantity of water used the greater the eventual damage to the soil, for thereby the subsoil water-table carrying the salts is lifted nearer to the surface. With a properly designed irrigation system the danger of salting ought not to occur; there are, however, many tracts of land where the supply of water is too limited to justify an expensive scheme of irrigation channels with corresponding drainage ditches at a lower level.

Take the case of a farmer with some water from an artesian well at his disposal, with perhaps little rainfall with land subject to alkali, and no considerable natural fall for drainage. If he merely grades the land and waters it, sterility rapidly sets in; the only possibility appears to be to take a comparatively limited area and to cut cut drainage ditches or tile drains 4 or 5 ft. below the surface, even if they have to be led into a merely local hollow that can be abandoned to salt. The bed thus established must then be watered at any cost until there is a flow in the drains, after which the surface is immediately cultivated and the crop sown. There should be no further application of water until the crop covers the land, the use of water must be kept to a minimum, and by the ordinary methods of dry cultivation evaporation must be allowed only through the crop, not merely to save water, but to prevent any rise of salt. With a loose surface and wind-breaks to minimise evaporation it has thus proved possible to grow valuable crops even on dangerously alkaline land. Superphosphate and sulphate of ammonia have proved to be useful fertilisers under these conditions; both tend to prevent the reaction of the soil becoming alkaline, and the calcium salts of the superphosphate minimise the injurious effects of the sodium salts that naturally accumulate in the land. On the other hand, nitrate of soda is a dangerous fertiliser. Attempts

have been made to reduce the salts in the land by the growth of certain crops which take up a large proportion of mineral matter, but I have not been able to ascertain that much good can be thus affected. Sugar-beet and mangolds do appreciably reduce the salt content, but are scarcely valuable enough to pay for such special cultivation and the limited irrigation water; the best thing appears to be to grow salt-bush on the non-irrigated margin of such areas, if only to prevent the efflorescent salts from blowing on to the cultivated portion.

Let us now turn to the problem of land reclamation as it occurs in north-western Europe. There are two main types of land that have hitherto been left waste, the peaty and the sandy areas. Of the peaty areas we can distinguish again between the low-lying moors bordering the lower courses of the great rivers; for example, in England near the mouth of the Trent, and the upland peat-bogs of which Ireland furnishes so many examples. They have these features in common—an excess of water, a deficiency of mineral salts, and, particularly in the upland bogs, a strongly acid reaction; but they possess great potential wealth in their richness in nitrogenous organic matter. It is in Germany and Holland that the methods of bringing into cultivation these moors have most completely worked out; in Germany, for example, it is estimated that there are about five million acres of moor-land of which about 10 per cent. are now under cultivation. The reclamation process must begin by drainage, which may be carried out by open ditches, but is most satisfactorily effected by pipes, despite the greater cost. The water-table must be kept some 3 ft. below the surface. In districts which afford a market for peat, as, for example, on the Teufelsmoor near Bremen, the reclamation often begins by cutting out the peat, the lower layer of firm peat being won, dried, and sold for fuel. The upper spongy peat can be used for litter, but some part at least must be thrown back. Where the burning peat is thus extracted the excavation is in places pushed further until the underlying sand is reached, and enough of this is dug to spread over the reclaimed area to a depth of 4 or 5 in. and mixed by cultivation with the spongy peat. Even when the peat is not removed, pits are often made in order to sand the land, so great an improvement does it effect in the character of the crops. However, sanding is not possible everywhere, and there are great areas under cultivation where the reclamation begins with drainage, followed by the cultivation of the immediate surface without either sanding or the removal of the burning peat, which indeed are impossible over large areas, but are carried out by the owners of small farms little by little. Special tools are required: certain forms of disc-ploughs and harrows give the best results; heavy tools for large scale cultivation by steam or electricity are furnished with broad roller-like wheels; even the horses must wear broad wooden shoes.

The next stage is the manuring, and it has only been the development of the artificial fertiliser industry during the last half-century that has rendered the cultivation of this type of land possible. On the alluvial moors where the ground water has always been alkaline, the peat is rich in calcium and no treatment with lime and marl is necessary (the English fens afford an example of this type of soil), but on the true peat-bogs (Hochmoor of Germany) the manuring must begin with a good dressing of burnt lime, or, better, of marl or ground chalk. For meadows and pastures two tons per acre of lime, or twice as much of carbonate of lime, should be applied; the amounts may be halved for arable land. This must be followed by about 5 to 8 cwt. per acre of basic slag and an equal amount of kainit, which applications should be renewed in the second year, but then diminished in accord with the cropping. However, some phosphoric acid and

potash salts must be continuously supplied, with occasional dressings of lime or chalk on the acid peaty areas. These latter also require in their earlier years nitrogenous manures, for the peat is slow to yield up the nitrogen it contains. The fertilisers should be nitrate of soda or lime, never sulphate of ammonia. The whole success of the reclamation depends on the use of these manures, as the peat in a state of nature is almost devoid of both phosphoric acid and potash; on the acid peats, again, normal growth is only possible after a neutral reaction has been attained by the use of lime or marl. With this manuring it is found to be easy to establish a good meadow herbage in a very short space of time; it is not even necessary to get rid of the surface vegetation of Erica and other heath and bog plants. The manure is put on and the surface is worked continuously with disc-harrows and rollers, but never deeply; *Lotus uliginosus*, rye-grass, Timothy, and cocksfoot, is sown in the spring and soon succeeds the native vegetation.

It is impossible to say what is the cost of the reclamation of moorland in this fashion; the big expense is the drainage and the construction of roads, both of which are entirely determined by local conditions. But of the value of the process when accomplished there can be no doubt. I have seen a case quoted from the *Ostfriesische Zeitung*, where a piece of moor bought for £75 was reclaimed and sold for £900; and, best test of all, one may see in places like the Teufelsmoor, near Bremen, families living in comfort on thirty to forty acres of what was once merely wild moor with no productive value.

Of even greater interest in England is the reclamation of heathland, which has of late years been proceeding apace in Germany. In this category we may include all land which owes its infertility to the coarse grade and low water-retaining power of the particles of which the soil is composed, the soil being at the same time as a rule devoid of carbonate of lime, and covered in consequence with heather and similar calcifuge plants. In England there exist extensive tracts of uncultivated land of this character in close proximity to the considerable populations, but the process of reclaiming such land for agriculture seems to have come to an abrupt conclusion somewhere about 1850, when the developing industries of the country began to offer so much greater returns for capital than agriculture. The land of the kind can be cultivated with success is evident from the mere fact that everywhere prosperous farms may be seen bordering the wastes, possessing soils that are essentially identical with those of the wastes. These were brought under cultivation when labour was cheaper, often without calculation of the cost because the work was done piecemeal at times when the men would otherwise have been idle. Were any strict account to be framed, the reclamation probably did not pay its way for many years, and it has only become possible again because of modern advances in science and machinery. As examples of the type of land, I may instance the Bagshot Sands on which, in north Surrey, in Berkshire and Hampshire, and again in its southern development in the New Forest, lie so many thousands of acres of uncultivated heath. No systematic reclamation has taken place, but everywhere farms have been carved out on this formation, often by the industry of squatters, and within reach of London the vast supplies of town manure which used to be available have converted some of it into fertile land. The crystallisation of common rights into charters for public playgrounds, its growing appreciation for residential purposes, will now always stand in the way of the utilisation of most of the Bagshot Sands for agriculture, but further afield there are many areas of similar character.

The Lower Greensand is perhaps equally discounted by its residential value, but on the Tertiaries of Dorset, the Crag and Glacial Sands of Suffolk and Norfolk—the brak, the Bunter Beds of midlands, lie many expanses of waste that are convertible into farming land, just as Lincoln Heath and much of the beautifully farmed land of Cheshire have been gained for agriculture within the past century. Equally possible is an attack upon the sandy areas, warrens or links, behind the sand-dunes on many parts of the English and especially the Welsh coasts; not all of them are wanted for golf, and many can be fitted for market-gardening. Of old the only way of dealing with such land was merely to clear it, burn the rubbish, and start upon ordinary routine at cultivation, but for a long time on such a system the crops will scarcely pay their way from year to year, and the permanent deficiencies of the soil in lime and mineral salts remain unrepaired. In Cheshire the enormous value of marl and bones in such a connection was early recognised; it has been the later discovery of the potash salts that renders reclamation a commercial proposition to-day. The method that is now followed is to begin by clearing the land shrubs, burning off the roughest of the vegetatiou and turning over a shallow layer in the summer, leaving the heathery sod to the killing and disintegrating action of sun and frost until the following spring. The manure is then put on—lime or ground chalk or marl as before, basic slag and kainit, and the sod is worked down to a rough seed-bed on which lupins are sown, to be ploughed in when they reach their flowering stage. The growth of the lupins makes the land, they supply humus to bind the sand together and retain moisture, they draw nitrogen from the atmosphere, and with the phosphoric acid and potash form a complete manure for succeeding crops. Sometimes a second crop of lupins is ploughed in, but usually the land is put immediately to an ordinary rotation of rye, oats, potatoes, and clover. When the heathland is divided among small tenants in an unreclaimed state cropping often begins without the lupins, the necessary nitrogen being imported by nitrate of soda, but for years the land shows inferior results. Only the tenant can rarely afford to lose the year the lupin crop involves, and so great is the demand for land in Germany that the State finds its preferable to let the tenant reclaim than to reclaim for him, and charge him as rent the cost of the more thorough process.

And now as to the finance of the operation; the reclaiming down to the ploughing in of the lupin crop costs from £5 to £6 an acre, the bare heath costs from £5 to £7 an acre, the reclaimed land after a few years' cultivation would sell at £20 to £30 an acre. Meantime the State has probably made a free grant for drainage, looking to get some interest back in increased taxation; the local authority has also made roads for which the increased rating due to a new agricultural community must be the only return. It is a long-sighted policy which will only find its full justification after many years when the loans have all been paid off and the State has gained a well-established addition to its agricultural land and its productive population. In comparing English with German conditions there are certain differences to be taken into account—in the first place the work of reclamation will be dearer in England because of the higher price of labour, then the land will not be so valuable when won because the higher scale of prices for agricultural products enhances the price of land in Germany. Next, I doubt, in view of the great industrial demand for men in England, if we have the men available who will bring to the land the skill and power of drudgery that I saw being put into these German holdings of thirty to forty acres in their earlier years of low productivity. Moreover, in Germany these

heaths are generally bordered by forests, in which the smallholder gets occupation for part of the year while his wife and children keep the farm going. For this, if for no other reason, afforestation and land reclamation and settlement should go on together. But, despite these drawbacks, I am still of opinion that the reclamation of such heath-lands is a sound commercial venture in England, either for a landowner who is thinking of a future rather than of a present capital, or for the State or other public body, wherever the waste land can be acquired for less than £5 an acre. The capitalised value of its present rental rarely approaches that figure, but the barrenest heath is apt to develop the potentialities of a gold-mine when purchase by the State comes in question. The map of England is so written over in detail with boundaries and rights and prescriptions that the path of the would-be reclaimer, who must work on a large scale if he is to work cheaply, can only be slow and devious.

There are other possibilities of winning agricultural land even in England, from the slob land and estuaries, from the clays nowadays too heavy for cultivation; but the problems they present are rather those of engineering than of agricultural science. What I should like in conclusion once more to emphasise is, that the reclamation of heath and peat-land of which I have been speaking—reclamation that in the past could only be imperfectly effected at a great and possibly unremunerative expense of human labour—has now become feasible through the applications of science—the knowledge of the functions of fertilisers, the industrial developments which have given us basic slag and potash salts, the knowledge of the fertility that can be gained by the growth of leguminous plants. From beginning to end the process of reclamation of moor and heath, as we see it in progress in north-western Europe, is stamped as the product of science and investigation. —*Nature.*

Statistics of Labourers Employed on Estates.

The following table shows the number of coolies of various nationalities employed on estates in the F. M. S. on the 31st December, last:—

	Indians.	Chinese.	Javanese.	Others.
Perak ...	52,552	3,236	6.292	5.580
Selangor ...	77,075	8,478	3,007	1,244
Negri Sembilan ...	12,010	12,186	1.949	1,295
Pahang ...	837	1,181	949	377
Total ...	142,474	25,081	12,197	8,496

The outstanding feature of the above table would appear to be the very small number of Chinese labourers employed in Perak as compared with Indians, there being very nearly 17 times more Indians than Chinese workmen on the estates.

In Selangor for every Chinese cooly employed on estates there are roughly 9 Indians.

The Indian and Chinese element in the labour force of Negri Sembilan is evenly balanced, there being as many Chinese as Indian labourers in this State.

Perak employs twice as many Javanese as Selangor and a little more than three times as many as Negri Sembilan.

The total number of labourers of all nationalities employed on Estates in the four States on 31st December last was 183,248 and compares with 179,610 on the 1st January, 1913.—*Grenier's Rubber News.*

DYNAMITE.

Use of Dynamite in Agriculture.

The October issue of *Tropical Life* to hand by the mail publishes Mr. F. G. Spring's notes on the effect of dynamite on Rubber which originally appeared in the *Federated Malay States Bulletin*. The notes run as follows :—

"It may be remembered that in October of last year a demonstration, on the use of explosives as applied in rubber cultivation, was given at the Experimental Plantation, Kuala Lumpur, by Mr. MacQueen, representing Nobel's Explosives Company, Ltd., of Glasgow. The results in this article are those obtained from an area which Mr. MacQueen subjected to gelignite charges.

"The land on which the experiment was carried out is of a poor laterite nature, and the rubber very backward in growth, four-year-old trees measuring about 12 in, in girth, 3 ft. from the ground.

"Three rows of rubber, running the length of the field and each containing thirty-four trees, were selected, one row being the dynamite plot, while the other two acted as controls. The cartridges were placed at a depth of about 2½ ft. below the surface of the ground, one cartridge between two trees 12½ ft. apart. (Distance of planting 12½ ft. by 25 ft.) The method of firing was by means of fuses and detonators.

"It is unfortunate that this particular soil is not one which would be expected to give the best results, sub-soils of a clay nature should respond better to the use of explosives. An experiment on a very much larger scale is being conducted at Castelton Estate, Teluk Anson, where the soil is of a heavier type. Below is a record of the figures in respect of the experiment conducted at Kuala Lumpur.

"Date of application of dynamite, October 25th, 1913:—

	Dynamite plot.	Control No. 1.	Control No. 2.
Average girth measured 3 feet from ground on October 30th, 1913	9·75 inch	9·5 inch	10·25 inch
Average girth measured 3 feet from ground on June 9th, 1914	12·31 inch	11·31 inch	11·87 inch.
Average girth increase from October 30th, 1913 to June 9th, 1914	2·56 inch	1 81 inch	1·62 inch.

"It will be seen that in the dynamite plot the average girth increase, over a period of seven months and a few days, amounts to 2·56 inch, while in control No. 1 the increase is 1·81 inch, and in No. 2 1·62 inch. It might here be stated that control No. 1 is adjacent to the dynamite plot, while No. 2 is some distance away.

"I would not care to say definitely that the excess in girth increase over the control plots is due to the effect of dynamite, but as the area in which the experiment was conducted shows more or less uniform growth throughout, and bearing in mind that one of the controls had the largest average girth at the commencement, it would appear that the explosive had good effect even on this soil: whether it is profitable will depend on how long the beneficial effects last. It is intended to re-measure the trees in a few months' time.

"With regard to the cost of application, 15 cents (100 cents=one Straits dollar of 2*s.* 4*d.*) per charge, inclusive of labour, would perhaps be a reasonable figure; one charge per tree is generally being allowed.,'

COFFEE.

The Commercial Aspect of Coffee.

Scholarly and extremely interesting lectures by J. H. Brindley, Manager of Coffee Department of Brooke, Bond & Co., London, Eng., Before School of Economics, London University—Printed herewith by special privilege of the author.

Part II.—(Concluded).

Coffee Development in Far East and Africa.

Recent years have seen a great development of coffee planting in Java, Sumatra and the Malay States, much of it not intended to be permanent but planted simultaneously with and between rubber, and by reason of its more rapid productiveness able to produce profitable crops before the rubber is ready for tapping.

The Robusta variety has generally been selected for this purpose, and while Brazil kinds were commanding higher prices, Robusta secured a very profitable market at similar rates. With the heavy fall in Santos kinds, however, a more than equivalent depreciation in Robusta has occurred, and I think intrinsically this variety has been much overrated. Indeed, I shall not be surprised if on many estates it is cut out much sooner than was anticipated to make room for the quicker growth of rubber even at present prices. How great the expectations from this source have been is indicated by a glance at the particulars of 26 rubber companies owned in England and operating in Java alone when it will be seen that at least 50,000 acres are so interplanted. Probably, with present conditions, there will be no great increase in such planting, and the unsuitability of Robusta, at any rate for the European market, is likely to be unfavourably reflected in prices, even more than is the case to-day.

To successfully cultivate coffee for a reasonable return on capital there must be the combination of a number of favourable factors. The soil must be suitable; elevation, temperature and rainfall must be normal, adequate and intelligent labour must be available, and it is essential that suitable transport facilities exist for bringing the produce to the nearest port for shipment.

The Sao Paulo Railway is a remarkable illustration. Owned by a Company with a capital of £2,650,000, it operates a comparatively short, but splendidly equipped line of only 134 miles from Santos, to Sao Paulo. It handles almost all the coffee shipped from Santos, and so profitable are its operations that the £100 stock commands even in to-day's depreciated market about £235. For each of the past two years dividends of 14 per cent, have been paid on its ordinary shares and the reserves are over two millions.

Other lines having a length of 13,000 miles of railway are operated in Brazil and, of course, much of the traffic is in coffee. The Costa Rica and Salvador railways furnish other illustrations of lines financed with British capital, depending largely on coffee transport for their revenue. In these, and many other instances, the railways have been built to meet and develop existing traffic though, of course, their provision has greatly stimulated it, but in our own Protectorates of East Africa and Uganda the railway has created the traffic.

The Uganda Railway, none of which, by the way, is in Uganda, was built by the British Government and orginally intendend to assist in the suppression of slavery and generally to let civilization into the heart of the Dark Continent. It runs from Mombassa to Kisimu (Port Florence) on Lake Victoria Nyanza, a distance of 584 miles. Built almost on the equator, it reaches its greatest height at Mau Summit, 8,200 feet above sea level. Thence to Port Florence the descent is rapid to its terminus of 3,750 feet. Built on meter gauge, it already earns 3½ per cent. on its heavy cost of nearly £6,000,000. Already its equipment has been proved to be quite inadequate, a heavier type of permanent way, making possible more powerful locomotives and good trucks of greater capacity, is absolutely necessary to provide for the rapidly growing needs of the rich district it serves. The Busoga Railway has recently been bu'lt as a feeder to it, and hopes are expressed that before long it will be possible to take a tourist ticket from Cairo to Mombassa, journeying *via* the Upper Nile, Lake Kioga, the Busoga Railway, Lake Victoria and the Uganda Railway. Coffee which indeed is indigenous to Uganda, has shown itself singularly responsive to intelligent cultivation there, and if the ravages of such disease as *hemelia vastatrix* can be scientifically frustrated, there is every reason to hope that large quantities of good coffee can be produced there, and already it promises to become one of the chief factors in the country's wealth. Coffee is also successfully cultivated in the British East African highlands of Nairobi, Kiambu, Lamoru and adjoining districts.

In Nyassaland the culture was first commenced in 1878 by Mr. Duncan, of the Church of Scotland Mission. He took out three plants, of which one only survived, but from it two years later he gathered 1,000 seeds. By 1896 ne fewer than 100 plantations had been opened up and a crop of 350 tons gathered. Lack of transport facilities and an increasing preference for cotton and tobacoo and tobacco culture have combined to diminish the supplies, and it is not likely that much capital will be attracted to the development of coffee estates there.

A glance at the mao will show that immense portions of the world within the desired latitude of 20° N. and 25° S. are neither in coffee nor any other product giving much account of themselves, but obviously a large propertion is physically quite unsuitable, and in many otherwise suitable places, such as North Queensland, the difficulty of providing adequate labour would prove quite insuperable. It should not be forgotten in this consideration that for any but really fine coffee the undeveloped resources of Brazil are still enormous, but present prices do not encourage the exploitation of them, even if the stringent legal restrictions now ruling were removed.

The Roasting, Etc., of Coffee.

To roast coffee is easy, but to roast it properly requires a good deal of skill and experience. Till comparatively recently anthracite coal or coke was universally employed, and even to-day many of the most modern plants in the United State are constructed for such fuel only. Indeed quite a number of coffee merchants there are still of opinion that gas fuel cannot produce equal results. My own observation do not endorse this view.

The problem to be solved is such an application of dry heat as will rapidly torrify the desired quantity of coffee in motion, and give an even roasting throughout the berry without brining any portion of it, and it is desirable that the steam given off during the process has facility for rapid

escape. It seems most appropriate that Browning should have been the poet who said :—

"Oh, the little more and how much it is
And the little less, what worlds away,"

It is only natural that such a proposition has been solved by a great variety of methods. In England, at any rate, gas is now triumphant, and the wire or open metal-work cylinder has, by experience, proved its superiority. Quite possibly, the future may be with the electrically heated roasters, but up to now the cost of current required renders it an extravagant fuel. In some places a battery of small cylinders has been found effective and this operation in shop windows, a good advertisement of the produce sold within, but there is no reason why large cylinders properly constructed and handled should not produce equally good results. The time occupied for a medium roast should be round about 15 minutes, and the cooling of the roast from 3 to 5 minutes.

Probably in point of time and fuel the most economical method is that of the internally heated gas cylinder, such as the "Tupholm" or the little "Uno" so extensively used by retailers throughtout the country. The "Hintonia" is of similar type, but has forced air draught to Bunsen burner.

Many patents and experiments have had to do with ease of loading and discharging ; and, as might be expected, the American makers have devoted much skill to the minimizing of labour by automatic fillers and dischargers. In this connection the name of Jabez Burns & Sons has a worldwide celebrity. I recently saw in New York an installation of four cyclinders in which two men can, and frequently do, roast 250 bags daily. Here the raw coffee is dumped in the basement, and by bucket elevators conveyed to the top of the building. The cylinders are constantly revolving, and both the filling and discharge are automatic and by gravity. The cooling is done on the floor beneath the roaster, and thence supply bins in any part of the building at a lower level are filled by gravity as required.

The curious lack of appreciation shown by the English for coffee to-day, and its enormous popularity amongst Continental nations, and particularly by the United States, challenges inquiry as to the causes which have produced so notable a fact. Undoubtedly "Tea" is the rival most to be considered in this argument, but the racial and temperamental reason sometimes given will not stand the test, or why should France, of the sanguine Gallic temperament, be keeping company with the lethargic Dutch ?

I shall not dogmatically assert the conclusions to which I have arrived, but I submit for your consideration that at the time of the disruption and consequent War of Independence of the United States, the Tea Tax having been the culminating head and front of our offences against the Colonies as witnessed by the ever-memorable Boston Tea Party of citizens disguised as Red Indians who, in 1773, threw the consignment of tea into the sea, naturally, public sentiment would be aroused, and as tea could only come *via* England, and coffee from Central America the West Indies, and Brazil was readily obtainable, it was used to the almost entire exclusion of tea, and national tastes became crystallised by the operation of sentiment and by economical factors combined. Indeed it is recorded that in Boston 500 ladies formed themselves into a society pledged not to drink tea. Various substitutes were brought into prominence, but nothing was found so suitable as coffee. Not till several generations had passed did the United States

become possessed of a great Pacific seaboard, and thus gained independent access to the tea-growing countries of China and Japan.

A similar argument seems to fit in with the Continental prejudices; for Russia, the only great tea-drinking European country besides our own, had China, as it were, at her back door, and the indispensable exchange of commodities was more naturally in tea. With Holland, as we have seen, it was the other way about, and her great possessions of Java, Sumatra and other islands of thu Indian Ocean more naturally furnished coffee.

Here in England tea and coffee had a field less prejudiced by artificial factors, and coffee kept well in the running till the middle of last century. Then, the culture of tea by English capital in India and Ceylon produced so much stronger and, therefore, economical a produce as to secure the undivided patronage of the working clossess. To this add the fact that coffee is more easily adulterated, as well as treacly messes called "essence," have given it a bad name. To these depressing influences must also be mentioned the fact that the most carefully selected and perfectly roasted coffee may be and often is spoiled in the making. Not that it is really difficult, but coffee calls for intelligent and sympathetic handling in every one of the operations between the grower and the drinker.

Patents innumerable, and many of them undesirable, have only tended to make the operation ot making a good cup of coffee a mysterious and difficult one. Yet the simple expedient of a wide-mouthed, fireproof jug, well warmed, one ounce of fine, ground coffee to the pint, absolutely boiling water poured on and well stirred with a wooden spooon, a very few minutes in a warm place to allow deposition of sediment, and a careful skimming of any floating scum is all that is required, provided good coffee freshly ground has been used. I do not know of any better method, though certainly a more economical one is possible with pulverised coffee, *i.e.*, ground to flour-like fineness, and the "Kin Hee' pot which consists of two receptacles, in one of which the coffee is made as described and a muslin strainer placed over it and then inverted on the second or pouring-out receptacle which is made to fit it.

Unlike cocoa, genuine coffee is not suitable for keeping more than a short time in tins, hence the fact that advertising has not lent its powerful aid in directing public attention to it, while mixtures, essences, and substitutes have hindered rather than encouraged the sale of the genuine product.

Personally, I think it will be wise to recognise that the working classes of England are lost to coffee, and to concentrate on the still large number whose weekly income is not expressed in shillings. A campaign of publicity on the real dietetic advantage of coffee as *par excellence* "the breakfast beverage." Acquaint them through the press and in our cookery schools how easy it is to make, and finally insist on the absolute necessity of good coffee freshly roasted and there will be no lack of due appreciation of this truly beneficent product.—*Simmons' Spice Mill.*

Spices.—There has been further considerable excitement in the Pepper market, for the demand continues from Russia, Denmark and Holland, and prices have further advanced, while spot stocks of White Pepper have become dangerously low. Should all the August-September shipments arrive safely without undue delay, the position will doubtless become easier, but there is, of course, a risk that some of these may be lost, and prices would then be very seriously affected. Black Pepper is also dearer, but the rise has not been so pronounced.—*The Produce Markets' Review.*

The Planters' Chronicle.

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Contents.

The Planting Expert contributes an article on Composts made this year at the Hoskerry Estate, and gives tables showing cost of two pits and analysis of the contents; paras on the need of manurial experiments with Hevea Rubber and Phosphate and Iron in the soil.

The Proceedings of the General Quarterly Meeting of the Mundakayam Planters' Association are published. Referring to the para in connection with the Rubber Growers' Association, we are strongly of opinion that the United Planters' Association should be affiliated to the Rubber Growers' Association. The former being an Incorporated body is eligible for membership (subject to the approval of the Council) at the minimum subscription for a Company, *viz.* £3. The Secretary will circularize District Associations to that effect.

From the *India Rubber Journal* we extract an article by Mr. E. B. Skinner on the Thinning out of Hevea Rubber Trees. The advantages are enumerated and appear conclusive. The saving in expense is noteworthy and we look forward to the conclusion of this article.

From the same journal we publish an article contributed to it by Mr. E. F. Barber, Planting Member of Council, entitled "A Plea for the Economical Use of Labour." The secret really lies in combination, and this will be eventually brought about by utilising the Labour Department.

Mr. Guy Turner sends us a few notes upon Accountancy, and we wish his good example would be followed and more original compositions sent in by the Planting Community.

We publish an interesting article by Mr. Boodle on the Ringing of Trees taken from the *Kew Bulletin*.

The Director of the Labour Department has proceeded on tour, after visiting Madras on business, to inspect the agencies at Villupuram, Trichinopoly and Karur, and visiting Mr. Day at Coimbatore, and returns to Bangalore on the 11th instant.

We hear that Mr. R. Fremlin and Mr. Conner have been gazetted to the Indian Reserve of Officers. We think it would be interesting to publish the names of those members of the Planting Community who have gone to the Front and in this Honorary Secretaries of District Associations could materially help.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Composts.

A Compost was again made this year at the Hoskerry Estate, in the same pits used last year which only needed repairing; the cost of filling the pits was a little more as the pulp pit was further off this year. In some of the layers Lantana ash and burnt earth were used instead of Line sweepings, otherwise it was made in exactly the same way as last year, for a description of which see *Planters' Chronicle* VIII. p. 654. The cost of making the compost was as follows:—

	Rs.	A.	P.
Repairing two pits, 10 x 6 x 3 ...	1	0	0
1 ton Bone Meal and Transport	98	0	0
Cost of Making the Compost ...	22	3	0
Cost of pandals	2	8	0
Total ...	123	11	0

The Compost was applied in October to poor Coffee and young clearings. It was dug out of the pit and spread out for two weeks before application and it then had some heavy rain on it, which undoubtedly caused a certain amount of loss of plant food. After this a sample analysed as follows:—

	Air dry material.	Ash.	Calculated to dry matter.
Moisture	8·55	—	—
* Organic Matter	25·30	—	27·67
Ash. Silica	34·33	51·90	37·54
Ash. Phosphoric acid ...	3·69	5·58	4·04
Ash. Potash	0·81	1·23	0·88
Ash. Lime	5·19	7·84	5·67
Ash. Other soluble matter ...	22·13	33·45	24·20
	100·00	100·00	100·00
* Containing Nitrogen ...	1·26	—	1·38

This is not so good a result as last year but as stated above the sample was not a fair one; it was not taken from the pit as in the case of the 1913 sample and it had been exposed to rain. Despite this, however, its value is considerably more than the cost of making as will be seen from the following figures. The Compost as applied consisted of 15 tons. Each ton contained. 28·2 lbs. Nitrogen, 82·6 lbs, Phosphoric Acid, and 12·1 lb, Potash. The value of these plant foods is based on the average prices current before the war and works out as follows:—

	Rs.	A.	P.
28·2 lbs. of Nitrogen at 7 as. 7 p. per lb. ...	13	5	10
82·6 lbs. of Phosphoric acid at 10 p. per lb. ...	4	4	10
12·1 lbs. of Potash at 2 as. 2 p. per lb. ...	1	10	3
Value of plant food per ton ...	19	4	11

As shown above the cost of making this 15 tons of Compost was Rs.123-11-0, *i.e.*, Rs.8-4 0 per ton. The profit therefore, is Rs.11 per ton. This is a bigger profit than in 1913 because the cost of making was considerably reduced, the pits having only to be repaired instead of built. The coffee to which the 1913 compost was applied did not show marked beneficial results but this was probably due to the abnormally dry season. No rain fell on the applied Compost till 24th April, 1914 when 20 cents came, followed by 55 cents on 2nd May. The rain fall from 15 October, 1913 to the commencement of the 1914 monsoon was only 1·20 inches with 55 cents as the largest fall.

Need for Manurial Experiments with Hevea Rubber.

In commenting upon a paper on the subject of the planning of manurial experiments by Mr. Barrowcliff, the Assistant Agricultural Chemist of the F. M. S. Agricultural Department, the *India Rubber Journal* makes the following pertinent remarks. "There is no department in the cultivation of Hevea which has been so much neglected as that of artificial manuring. Read what one will, very little satisfaction can be obtained on the subject, simply because the work has never been tackled. Perhaps the infancy of the industry explains a lot, but while admitting so much we do feel that agricultural chemistry on Hevea estates requires more backing. All that we can really say to-day is that manurial work increases the growth; we presume that increased rates of growth mean more latex and that more latex means more rubber. But for these very vital assumptions we have no authentic records of experiments to quote for support. We do not believe that the average estate manager can reasonably be expected to compile the statistics and record the observations; it is work which calls for the trained scientific mind if the results are to be reliable. This is especially the case with rubber trees, since we are dealing with something which is generally regarded as a waste product; and not a substance or structure essential to plant life."

Very few reliable manurial experiments have been conducted on Rubber estates in South India. I have recently heard from Mundakayam that tapping experiments there distinctly point to the following conclusions, but I cannot produce figures to prove these.

(*a*) Young trees under 20 inches girth at three feet from the ground should not be tapped.

(*b*) The one cut system pays.

(*c*) Trees in tapping must be kept in a vigorous growing state by cultivation and manuring. Any check in growth is reflected in bark renewal.

Phosphates and Iron in the Soil.

Experiments in Java confirm Hilgard's conclusions that if soils containing a large amount of Iron oxide are fertilised with soluble phosphates, the phosphoric acid is likely to be quickly withdrawn from useful action so that any excess not promptly taken up by the crop is likely to become inert and useless. The phosphoric acid tends to combine with oxides and hydroxides of Iron especially, and of Aluminium to a less degree, and the Iron and Aluminium phosphates formed are for all practical purposes insoluble and inaccessible to plants. On such soils slowly soluble phosphatic fertilisers such as Bone Meal and Basic Slag produce the best results. If soluble fertilisers such as Superphosphate are used they produce the best effect when applied in small and frequent doses so that the crop takes up the phosphate quickly and leaves none to be locked up with the Iron.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS.

Mundakayam Planters' Association

Proceedings of the General Quarterly Meeting held at the Mundakayam Club, on Saturday, 7th November, 1914, at 10 a.m.

PRESENT.—Messrs. H. B. Kirk (Chairman), R. Harley, J. J. Murphy, R. Tait, E. Hall, A. W. Ruxton, A. Hamond, H. M. E. Howson and G. West (Honorary Secretary). *By Proxy*: Messrs. J. R. Vincent and W. O. Asher. *Visitor*: Mr. E. D. Atkins, Peermade Magistrate.

The Minutes of the last General Meeting and of three subsequent Committee Meetings were held as read and confirmed.

On the proposal of Mr. Harley seconded by Mr. Hall, Mr. H. M. E. Howson was appointed a member of the Committee in place of Mr. Hall who had resigned.

Mr. Murphy proposed "That all subjects of interest in connection with the District may be discussed and Resolutions passed thereon at an ordinary General Meeting without notice, with the exception of alteration to the Rules and Regulations regarding Labour. All such Resolutions passed at a Meeting shall be effective, provided always, that upon the written request of four members not present or represented at the Meeting, the Honorary Secretary shall convene an Extraordinary General Meeting to consider the said Resolution or Resolutions within one month from the date of publication in the *Planters' Chronicle* of the Proceedings of such Meeting, and that the following Sub-Committee be appointed to revise the Rules and submit the same to the next General Meeting :—

J. J. Murphy, Esq.
J. B. Vincent, Esq.
H. B. Kirk, Es.

and the resolution was unanimously carried.

The question of the erection of a Cattle Pound at Mundakayam was again brought before the Meeting and after some discussion, the Honorary Secretary was requested to write to the Peermade Magistrate and find out the cost of a similar Cattle Pound at Peermade.

With regard to the Resolution passed at the last General Meeting of the Association that the Honorary Secretary write to the other local Associations and obtain their views as to the formation of a Labour Commission separate from that of the U. P. A. S. I., the Honorary Secretary intimated that he had only received two replies, one from the Central Travancore Planters' Association and the other from the South Travancore Planters' Association both of which indicated an unfavourable attitude to the proposal. Further discussion on this question was deferred to the next Meeting.

Mr. Ashton Hamond was unanimously elected to represent this Association at the forthcoming Sri Mulam Popular Assembly at Trivandrum.

The Chairman reported particulars of a case of suspicious death upon his Estate and in view of the causal manner in which the matter had been treated by the local Police, he suggested that a European Coroner be appointed for this District and stated that he had laid the whole facts of the case, along with his suggestion, before the Commissioner of Police. Mr. Hamond proposed that the matter be left over until the Chairman received a reply from the Commissioner of Police. Mr. Harley and Mr. Murphy strongly resented the suggested appointment of a Coroner, and the latter proposed the following amendment "That it was unnecessary to ask Government to appoint a European Coroner." This was seconded by Mr. Harley and carried.

The Honorary Secretary read certain correspondence with regard to the unsatisfactory state of the Kottayam-Mundakayam Road and it was unanimously agreed on the proposal of Mr. Hamond seconded by Mr. Murphy "That Government be asked to put Culverts instead of Irish Drains on the Kottayam-Mundakayam Road where the lay of the land lends itself to it." The Chairman then stated that the Peermade-Mundakayam Road was in a similar condition and undertook to write to the Honorary Secretary of the Central Travancore Planters' Association and draw his attention to it, The condition of the Kanjirapally-Errattupettah Road was also brought under the notice of the Meeting by Mr. Murphy whe proposed "That the attention of the Executive Engineer, Kottayam be invited to the neglected condition of the Kanjirapally-Errattupettah Road and that a copy of this Resolution be sent to the Chief Engineer, Trivandrum." Mr. Harley seconded and the resolution was carried unanimously.

Consideration wav then given to the suggested improvements at the Kodimatha Landing Stage, Kottayam, and correspondance anent same was read to the Meeting. The members were agreed that an improvement in the landing stage facilities was highly necessary and the Honorary Secretary was instructed to lay the matter before Government and to press for something being done as soon as possible.

Reference was made by the Chairman to certain correspondence which had taken place relative to the Rubber Growers' Association and pointed out that the U. P. A. S. I. was not affiliated to this Association. Various members thought that the United Association should certainly join the Rubber Growers' Association and Mr. Murphy proposed "That the U. P. A. S. I. should be asked to join the Rubber Growers' Association, the small subscription to be met out of their existing Funds and failing their compliance with this request, that this Association should then join." This was seconded by Mr. Hamond and carried *nem con.*

The Chairman stated that there was a rumour abroad locally that the Government proposed to remove the present Magistrate's Court from Mundakayam. He pointed out that for many reasons this was to be deplored not only on account of the benefits derived by the community from the presence of the Court at Mundakayam but also on account of its deterent effect upon crime. The Honorary Secretary was asked to write to the Dewan upon the subject.

The Honorary Secretary reported that a sum of Rs.1,276-2-0 had, up to date, been received by him from Estates in the District towards the various War and Relief Funds and that he handed this sum to the Mundakayam Magistrate, President of the local War Fund Committee.

Mr. Hamond intimated that he had met Mr. Richardson who stated that in connection with his endeavours to obtain a Tea Theft Regulation, it would be of considerable assistance to him if the Rubber Thefts Regulation were more strictly observed by Rubber Planters, The Honorary Secretary was thereupon asked to circulate copies of the Rubber Thefts Regulation among the members.

It was decided to hold the Annual General Meeting of this Association at the Mundakayam Club on Saturday, 16th January, 1915.

A vote of thanks to the Chair terminated the Meeting.

(Signed) H. B. KIRK,
Chairman.

(,,) GEORGE WEST,
Hony. Secretary.

RUBBER.

The Thinning out of Hevea Rubber Trees.

By E. B. Skinner.

The question of thinning out is not the least important of the many important matters at present demanding the attention of those interested in the plantation rubber industry. The days are now past, I suppose, when new clearings are planted at 10 ft. by 10 ft., but much careful study and the comparison of many statistics will be necessary before we can claim to have grasped thoroughly the best methods to pursue, in thinning out overcrowded trees.

On the estates in which I am interested it is now five years since we first devoted much attention to the question. At the beginning of 1909 thinning out was begun, and since then until the present moment the work has been carried on steadily, and the results compared, and the subject has never been allowed to fall into the background, During the past three years our investigations have been enormously helped by the work of an analytical chemist, and in view of the excellent results obtained by him, we have lately added an agricultural chemist to our staff, whose work also should produce valuable results.

We had already long since seen enough to convince us of the great importance of this subject, and the more the question is studied the more overwhelmingly important does the proper spacing of the trees appear to be. It may be urged that Hevea brasiliensis is normally a jungle tree, and that it is natural for it to be closely surrounded by dense vegetation, that to plant it in cultivated soil with abundance of light is to grow it in artificial conditions, and is running the risk of not obtaining the best results.

My answer to this is that we have practically no statistics or definite or reliable information as to the yield of Hevea rubber trees growing in the jungle, as to the duration of yield during the life of a tree, or as to the renewal of bark, and not very much as to the quality of the latex or the rubber as compared with the plantation product.

Until we have these, it seems to me that our best course is to rely on information obtained from sources within our ken, and all such information appears to point conclusively to the fact that Hevea brasiliensis, though a jungle tree, is happier and more profitable when widely, than when closely planted.

The two chief advantages to be gained by thinning out or by wide planting, are :—

(1) That the trees are healthier, yield more, and renew their bark quicker, and

(2) Great economies are effected because less labour is required to tap an equal area, and the yield per tree being better, less labour is required to produce an equal amount of rubber. Economies in tools and cups naturally follows.

Let us consider first the question of the health of the tree, yield of rubber, and renewal of bark.

The importance of sunlight to the health of a plant cannot be too strongly insisted on. The shape of branch and leaf of every green plant is dictated by the necessity of exposing as great a leaf surface as possible to the rays of the sun, and no green plant deprived of light can produce the

chemical changes on which its proper supply of nutrition depends. The first effect of close planting on a tree is that its branches, as it grows larger and throws them wider, come into contact with those of its neighbours. Light is gradually shut off from the lower branches and from the base of the tree, and as the growth and health of any part of a plant are directly dependent on the supply of light, the lower branches gradually die and fall off, leaving rotting stubs sticking out from the main stem. The tree, in its efforts to obtain a sufficient supply of sunlight for its leaves, throws up long suckers, parallel to the main stem. After a time, as the tree grows taller and taller in its efforts to overtop its neighbours, and takes not only its own, but also their supply of sunlight all its good leaf and wide-spreading branches are lost, and their place is taken by a closely packed bundle of suckers. These are very liable to be torn oft by the wind, causing great damage, and often splitting and permanently injuring the main trunk of the tree. There is no room left for each sucker to bear a normal amount of leaf, so each is provided with a small tuft at the top, since Nature's economy forbids the production of leaves where they receive no sun, and therefore can be of no use. The older a tree grows, the longer these suckers become, but though there is a greater length of branch and trunk to be provided with food, there is no room for an increasing head of leaf. Every tree is surrounded by neighbours who are growing taller as it grows, and all available space for leaves having been filled up while the trees were still young, the old trees with their great length of timber and branch are dependent upon the same amount of leaf as sufficed for them when small, but which is, of course, quite inadequate as age and growth increase. The result is obviously starvation.

This is the result where there is no special strain on the trees, as everyone who has walked through a closely planted beech wood or hazel grove knows. But the Pará rubber tree is called upon to do much more than supply itself with food, as ordinary trees do. It is constantly called upon to replace bark and latex removed by tapping. As this process goes on monthly and yearly, and the food supply of the tree remains the same owing to a small head of leaf, the only possible result is the gradual weakening of the tree, so that even on estates where the quality of tapping has always received careful attention, where the tappers are well trained and no wounding has taken place from the first, a time arrives when the bark renewal becomes so poor, and the surface of the tree so uneven, that it is quite impossible to avoid wounding. Later on, if tapping is persisted in under the same conditions, the surface of the tree becomes covered with lumps and knobs, and no amount of care suffices to avoid serious damage to the trees in tapping. At the same time as this deterioration of bark is taking place, the yield, instead of increasing yearly with the age of the tree, first becomes more or less stationary, and then actually decreases.

An instance of this may be given. On one estate where the trees were planted at 14 ft. by 14 ft., the yield was very good until about the sixth year of tapping. The trees were then a good deal over-crowded, and it became quite noticeable that the yield was falling off. At the same time, the renewed bark surface became uneven, and it was impossible to avoid wounding, in fact many of the trees in this area felt the effects of tapping so much that they became permanently injured, and that in spite of the fact that the standard of tapping on the estate was very good, and that wounding on normal bark was of late occurrence. It was then decided to cut out the worst trees, in order to save the better ones, to stop tapping entirely on renewed bark, and to tap lightly on original bark above the bark that had

been tapped previously. The trees were therefore reduced from about 200 to about 90 to the acre.

The result of this was that the yield per tree for the following year rose 80 per cent., and the renewal of bark showed signs of great improvement. It is now four years since this was done, and the bark renewal is so good that the trees are now fit to be tapped below, on the surface which had suffered so severely previously. The yield has also become normal, and gives promise of increasing yearly.

At the same time it must be noticed that the renewal of bark, though satisfactory, has not been so rapid as it would have been had these favourable conditions been established earlier. The head of leaf when cutting out was begun was very small, and it will still be some time before the trees produce branches and leaves enough to give the very best yield. Similar results were obtained on another area where the trees were originally planted at 10 ft. by 10 ft. When tapping was started, there were about 300 trees to the acre. These were first reduced to 100, and afterwards were gradually thinned out until the whole number is now about 60 to the acre. It is interesting to note here that at its best this area yielded as much as over 900 lb. per acre, but after reaching this point the area rapidly showed the results of close planting. and before thinning out began the yield had dropped to below 400 lb. per acre, and the trees showed bad renewal of bark, low percentage of No. I rubber, and all the other effects of close planting. Other areas may be mentioned, planted originally at 20 ft. by 20 ft., where the trees were not thinned out until they were about nine years old. At this time the surface of the trees had not begun to suffer, but it was noticeable that the yield had ceased to increase, and even begun to fall off, that the bark renewal was becoming slower and slower, and that the branches had dropped off, and were being replaced by suckers. The growth also remained practically stationary. These trees were thinned out, leaving from 70 to 80 to the acre, according to local conditions.

Our experience in these cases, as in many others, has, then, convinced us that thinning out of closely planted areas leads surely and certainly to an increase in the yield and a quicker renewal of the bark.

We may now proceed to consider the second great advantage claimed for a widely planted, or severely thinned out estate, over a closely planted one, namely :—

The greater economy with which it can be worked.

First, let me emphasise again what I have already pointed out, that the yield from, say, an area of widely planted trees will be as great as, or greater than, that from an area of closely planted trees. Bearing this fact in mind, it may be asserted in the first place that fewer coolies will be required for tapping since fewer trees will have to be tapped to produce, say, one pound of rubber. I have heard it said by the critics of thinning out that a coolie who taps an acre has to cover an acre, and that if his task is say, 300 trees, he will get through it quicker if they are all on one acre than if they are on several. In fact, however, it is not the actual area on which the trees stand which counts, but the number of rows up and down which a coolie has to walk, and it is obvious that there must be more rows of trees in an acre bearing 300 trees than in an acre bearing, say, 70 trees. The coolie's task is not proportionately increased if he has to cover four acres widely planted, as he has fewer rows to walk up and down.—*The India Rubber Journal.*

(To be continued).

LABOUR.

A Plea for the Economical use of Labour.

By E. F. Barber (Member, Legislative Council, Madras).

It is true that this plea is made rather late in the day, but it is certain that up to a few months ago the situation as regards the demands for labour and the supply was critical. With war now on us, and the consequent calls for economy, it is possible that the strain will be relieved; but since the relief in the form it has taken is only objectionable, we all of us hope that it will be only temporary. It would seem, however, that while we have this relief all the organizations that deal with securing the sufficient supply of labour whether for estates in Ceylon, South India, or the Straits should set themselves so to arrange that what has occurred in the past shall not occur again.

Economy in the use of labour can be divided into two heads. Economy on the estate when it is the duty of the superintendent to see that he gets the best value possible for the wage paid, and economy in securing labour. I do not propose to touch on the former aspect, which, after all, comes in the A. B. C. of a planter's training, except inasmuch as it hinges on the second aspect.

In considering the matter, the first question one asks oneself is for whose advantage is the labour employed. The answer is not for the individual planter, nor even for the private interest; the true answer is for the capitalist, in this case the British public, that has invested in planting ventures.

If this answer can be accepted it will be realised at once how futile and extravagant competition in the past has been. It is not a case of compartments, either in product or country. There is no advantage to the investor if the rubber man bid up the tea man, nor is there any advantage in the F. M. S. bidding up Ceylon; the ultimate expense comes out of the same pocket.

The means of remedy do not lie with the planter, to a small extent only do they lie with proprietors, boards of directors, and other representatives of properties; they lie with the public, which has to pay the price if they be not adopted.

The superintendent of an estate has to do his best for the proprietors whether it be in the upkeep of the property or in the carrying out of the programme of development laid down for him, and it is the nature of things that, if he be left to himself, he comes into sharp competition with his neighbours, some of whom, it may be, represent identical interests, and what is true of individuals is true of districts and countries also.

One of the worst forms of labour wastage is employing coolies in districts that are not suited for them. The result of this is a high death rate and poor outturn owing to sickness. Many planters can confirm this, and also that the employment of unsuitable labour directly militates against true economy on the estate itself which is so necessary for cheap production. A sick and discontented labour force is of little use to an estate itself, and since they might be employed more advantageously elsewhere, a direct loss to the community at large.

It is obvious that the remedy lies in combination. If the labour supply from the present recruiting grounds is insufficient, new recruiting grounds must be found. These new recruiting grounds cannot be properly exploited by individuals, nor is it a work that can be left to amateurs. Organization and trained men are essential.—*The India-Rubber Journal.*

ACCOUNTANCY.

A few notes upon Accountancy and methods which save time and trouble.

The very great advantage to be gained by good book-keeping is acknowledged, but I daresay there may be some planters who regard book-keeping as troublesome and useless. Their employment renders them naturally disinclined for close attention to books. It is not my intention here to set forth any one particular system of accounts, but to give a few hints and suggestions which may possibly prove useful.

A planter should adopt a sytem of accounts the accuracy of which is capable of proof, and which will show him what his profit or loss is upon each year, and how he stands in respect of assets and liabilities.

It is clear that all financial accounting ultimately evolves from or merges into the receipt and payment of money and therefore the Cash Account is the basis of all accounting in any system. Such being the case, a few remarks upon the Cash Account will not be out of place.

The Cast Account is, or ought to be, an absolutely correct account (an absolutely correct Revenue Account has yet to be prepared) and a statement showing the result of *completed* transactions.

If the planter has an Estate Banking Account he can combine the Bank Account into his Cash Account in one book by having columns ruled for Bank and Cash. I know this form of Cash Account is objected to by some on the ground that Bank items get into the Cash column and *vice versa*. But if carefully kept there should be no reason for this, and it saves time and trouble. A separate book called a Bank Book can, however, be kept.

Every payment made should be numbered in the Cash Book and vouchers obtained, and a corresponding number put on the voucher.

The Cash Book should be balanced monthly and the cash in hand should agree with the balance as shewn by the Cash Book. Now it may sometimes happen that on counting the cash an excess or deficiency may be found. You should at once enquire into the cause of it and if you fail to discover the cause you should carry the difference to a Suspense Account for the time being.

Always keep the Cash Book up to date. Make your entries as soon as possible after the transaction has taken place. Reconcile the Bank columns with the Bank Pass Book at least once a month.

If a proper system of accounts is in force a Ledger must be kept. The Ledger may be briefly defined as a book in which a planter's transactions are "laid up" or recorded in a form easily accessible for future reference. A Planter's Ledger should contain his Capital Account; Block Account showing value of his property, various expense accounts such as cultivation charges, crop charges, etc.; a Receipt Account for crop sales; accounts for Sundry Debtors and Sundry Creditors, and a Profit and Loss Account.

The Ledger is best spaced out by placing all the Capital Accounts at the beginning, allotting them one or more folios apiece as may be required. Then, after leaving a dozen openings for any future capital items, the Receipt Accounts should be commenced and then those recording Expenses. The Profit and Loss Account should be placed say twenty pages from the end of the Ledger.

Now a planter may be in doubt what value to place upon his estate for book-keeping purposes. A Planter's Estate is what is known as a "fixed" asset that is to say he makes his profit by *keeping* it. A "floating" asset is one by which profit is made by *parting* with it. If a ready-made estate is bought, then the purchase price is the value which should be debited to Block Account. If land is bought and planted up, then the cost of the land plus the cost of bringing it into a producing stage is the value to be put upon it.

All expenses in connection with new clearings should be charged off to Block Account until they reach a producing state, when all expenditure should be debited to Revenue Account.

As the owner of a "fixed" asset does not seek to make it profitable to him by its market value, but by its use, it has been held that any increase or diminution in its selling value may be disregarded in arriving at a year's profit. So no depreciation need be written off the value of an Estate.

Now I wonder how many planters, especially those living in districts where the coolies are paid up weekly, keep a strict account of "unclaimed wages." It is, I believe, often the case that sums unclaimed on pay day by coolies personally are handed to their Maistry or a relation. This is wrong in principle. A strict account should always be kept of "unclaimed wages." Where coolies are paid up fully each week, the total amount payable on Pay Roll should be entered on the credit side of the Cash Book and any wages unclaimed should be entered on the debit side (representing so much cash not paid away) and carried to an "unclaimed wages account" in the Ledger.

GUY TURNER.

Yercaud.

FORESTS AND FLOODS.

Under this heading a letter in *Nature* discusses the significant circumstance that tilled soil absorbs more rainfall than earth that has laid untouched. As an experiment, water was poured into soil contained in pots consisting of two series: (*a*) in which the soil was consolidated, (*b*) in which the soil was broken up and loose. It was observed that the water entered the soil of the undisturbed pots more slowly than the other, and that the water more quickly passed through the soil in these pots than the other. After having taken necessary precautions that the soil had been entirely wetted throughout, the pots were weighed and showed that the disturbed soil held a much greater amount of water than the consolidated soil.

It may be asked: What connexion has this with forests and floods? In the letter under consideration, it is maintained that the soil in which trees are growing is looser than that which is bare: consequently it is in its best condition for absorbing and retaining the rainfall. It is maintained further that the decaying vegetation on the surface under trees has also a beneficial effect, as it absorbs water and acts as a mulch, preventing drying.

It would seem to us that the conditions obtaining in the pots are not perfectly comparable to the characters of a forest or bare hill-land soil. The presence of a covering of decaying vegetable matter in the forest introduces factors not involved in the pot experiments. The main point brought out, however, is illuminative, and well worth bearing in mind.—*The Agricultural News.*

TREES.

The Ringing of Trees.

L. A. Boodle.

The injuries sometimes inflicted on trees by squirrels were described a few years ago in the case of young trees of *Thuya* and *Cupressus*, specimens of which had been sent to Kew by Mr. R. B. Rogers, of Hexworthy, Launceston, Cornwall. The immediate injury is to the bark,* which is stripped off the trunk in places, sometimes on the side, sometimes all round. That is, in the latter case the stem is completely ringed, and an experiment in plant-physiology is the outcome of the squirrels' labour. In the examples referred to the damage had been very severe; long strips of bark had been removed, so that in one case a considerable portion of the trunk appeared as a pole of bare wood with islands of bark upon it. Branches of the stem inserted within some of these islands were still living, and bore healthy foliage, although their isolation by the removal of the bark from around the islands had taken place more than two years previously.

Some further specimens injured in a similar manner have recently been received from the same donor. In one of these the bark had been ringed, and the tree had eventually died, but it was found by examining the annual rings that the part above the wound had lived for at least four years after the ringing-operation. Other specimens examined showed from three to five years' growth above the ring-gap.†

In these cases the wood exposed by the injury is perfectly bare, and of course no new layers of wood have been formed on its surface, as the stripping of the bark involves the removal or death of the cambial layer. The outer layers of the wood exposed to the air soon become dry and useless for conduction, hence it is clear that the older layers of wood must be capable of continued fairly rapid transference upwards of water coming from the roots, as evidenced by the continued life of the parts above the ring-gap. In the case of the specimens previously examined, though some of the branches remained fresh, the water supply had proved insufficient to keep the tops of the trees healthy.

The effect of ringing differs in different kind of trees. Various experiments have been made, and a study of the results of the operation proved useful in the early days of plant physiology in leading to a knowledge of the route of conduction of water and of elaborated food-substances in plants, Experiments in ringing were made by Malpigi and Ray, of whom the latter mentions that a holly tree lived for several years after a ring of bark of a hand's breadth had been removed from the stem so as to leave the wood bare. Since this early observation numerous experiments have been made on several kinds of trees, and form two classes, *viz.*:—(1) bark-ringing, *i.e.*, the stripping off of a ring of bark as in the cases mentioned above; and (2) wood-ringing, *i. e.*, making an annular cut into the stem through both bark and part of the wood.

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* The word "bark" is used here for convenience in the vernacular sense to include all the tissues outside the wood (or outside the combium).

† By this is meant the annular gap in the bark, made by the operation of bark-ringing.

Bark-ringing.—The effects of bark-ringing depend upon the interruption of the bark and the exposure of the wood. The break in the continuity of the bark prevents the normal conduction of elaborated food-substances (albuminous and carbohydrate) from the parts above the ring-gap to those below, since these bodies are ordinarily conveyed through the bark†† (or more precisely the phloem). Hence, if there are no leaf-bearing branches on the stem below the point of ringing, starvation of the roots ensues. This may be slow, seeing that there is a store of food in the bark of the roots and of the base of the trunk to draw upon, but the growth and absorptive powers of the roots will eventually be checked, and in some cases the functional failure of the roots may be the final cause of the death of the tree.

The exposure of the wood, where the bark has been removed, introduces other factors endangering the life of the tree. The supply of water for the upper part of the tree has all to pass through the wood at the level of the ring-gap, and from several causes the conducting power of this wood tends to become more and more curtailed until the requisite amount of water can no longer pass through it. Owing to the surface of the wood being in contact with the air, the outer layers of wood become dry and useless for conduction. This alone may soon render the water-supply insufficient in species with only a thin zone of sapwood, since true heartwood is incapable of conducting the transpiration stream. On the other hand "sap-wood trees" (*i. e.*, those which form little or no heartwood) can usually survive the operation of ringing for a long time, *e. g.*, several years. Among these the progressive drying of the wood from without inwards may finally restrict the area of functional wood until it reaches the critical point, or this result may be accelerated by a fungal disease attacking the wood and rendering some of it useless. Again, in tress which form heart-wood, the production of this accounts for the loss of a certain proportion of the wood available for conduction. While no new wood is added at the level of ringing, and functional wood is lost externally by drying, there is a further loss internally owing to the yearly conversion of some sap-wood into heart-wood.

To summarise, bark-ringing eventually causes the death of the upper part of the tree, because the water supply becomes inadequate, either through loss of conductivity in the wood at the level of the wound, or through deficiency of absorption by the roots.

An interesting example of bark-ringing may be quoted here. A forked pine-tree was chosen by Hartig for an experiment. The tree was 118 years old, and the trunk was forked at 4½ m. above the soil into two approximately equal stems. The bark was peeled off all round one of these stems at about 3 m. above the point of forking. When the tree was felled 18 years after this ringing operation had been performed, it was seen that the crowns of both stems were still sound, but that the foliage of the ringed stem was thinner and weaker than that of the other stem. It was also found that growth in thickness had practically ceased after ringing on the side of the trunk situated below the ringed branch. The reason for the long-continued life of the ringed stem is that the roots attached to the base of the trunk on

†† Any conduction of food-substances that may take place through the wood in the downward direction would be against the transpiration current, and might be expected to be slight. That it is slight of non-existent is suggested by the fact that growth in thickness of the stem practically ceases below the ring-gap.

the side below the intact stem had received normal nourishment, and therefore, having remained healthy, had been able to supply the trunk with a good supply of water.

Wood-ringing.—The experiments in wood-ringing made by Strasburger and others show that, though the inner (older) layers of sap-wood can conduct water for the transpiration current, the heart-wood cannot do so.

The first of the following cases serves as an example of a sap-wood tree, the remainder being "heart-wood trees" (*i.e.*, trees which form heart-wood).

Two beech-trees 150 years old had trunks 32 cm. in diameter. These were ring-cut to a depth of 8 cm., and the trees still bore foliage a year and a half later.

The trunk of an oak 50 years old was ring-cut into the heart-wood, and its foliage withered in a few days. Another oak of the same age, which was cut similarly but not quite through the sap-wood, did not wither for some weeks.

The trunk having been cut to the heart-wood in a tree of *Prunus avium*, and in a *Robinia*, wilting of the leaves took place in two days in the first case, and in a few hours in the second.

Various other experiments and observations have been made in bark- and wood-ringing, but enough has been quoted to illustrate the nature of the results obtained in this way.—*Kew Bulletin.*

Coffee.

Rather larger deliveries for both the home and export trades last week imparted some firmness to the markets, but with increased difficulties as to shipping to the Continent, the latter business has again been checked. Fortunately, perhaps, imports have not been heavy, or the accumulation of stocks would have caused further depression. Reports from the growing countries are not satisfactory. Brazil, with its monetary troubles, is not a very willing seller, and the fluctuations in the exchange—which has advanced from 11½*d.* to 13*d.* in the week—make it difficult to quote firm prices. The reports from India are also decidedly bad, want of rain at the necessary period having caused a small and undeveloped crop, and it is said that estates which produced 120 tons last year will only yield about 25 tons this year, which will help to keep prices firm for the small stock of old crop still remaining in this country. The Central American crops generally will not be large. Costa Rica, from the Atlantic side, is said to be above the average, but this is of little value for the home trade. The Pacific side, where the fine quality is grown is said to be very short, and it is thought that all mild growths will be less than an average.

London Coffee Returns.

	Home* Consumption,		Export.		Stock.	
	1914. Tons.	1913. Tons.	1914. Tons.	1213. Tons.	1914 Tons.	1913. Tons.
For week ended October 10 ...	277	275	459	632	19,908	12,182
For 41 weeks ended Oct, 10 ...	12,128	11,985	19,878	16,915	—	—

* The Home amount contains a proportion for Export delivered by cart.

—*The Produce Markets' Review.*

The Planters' Chronicle.

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THE U. P. A. S. I.

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Contents

The Scientific Department publishes an article on Coffee Pruning, Rubber Experiments and Bananas.

"Manurial Experiments" by Mr. Barrowcliff is extracted from the *India Rubber Journal*. A plan of experiment is given, which if followed, will give the desired information.

Since the commencement of the War, the Planting Expert has more than once called attention to the difficulty of procuring potash and has shown what substitutes can be used, and the *Agricultural News* deals with the same subject.

The trade relations of India with Germany and Austria-Hungary are of special interest at this juncture.

We continue Mr. Skinner's article on the "Thinning out of Hevea Rubber Trees," which is replete with valuable suggestions, though no hard and fast law can be laid down.

The Rubber Growers' Association's Correspondence with the Foreign Office with regard to the surtax imposed by the French Government on Rubber, has elicited the information that under certain conditions the *Surtaxe d'entrepot* will not be levied, and the Foreign Office hold out no prospect of the French Government waiving the condition.

"C." sends us a letter on "Estate Tapping Experiments," which is referred to by the Planting Expert in his article and "Optimum Quod Primum" supplies us with a "Writer's Report," which raises a smile, if that faculty is not wanting in the reader.

The Planting Expert will leave Bangalore on Sunday (13th) and proceed to Madras to attend a meeting for discussion, by representatives of the Agricultural and Industrial Departments on certain of the business aspects connected with some of the commercial crops and aids to agriculture, being held there from 14—17, December. Mr. Anstead is on the Committee which will specially discuss the subject of manures. This is the only subject down for discussion which is likely to interest South Indian Planters.

Mr. Clementson will take charge of the Labour Department business in the Districts of Chingleput, North Arcot, South Arcot, Tanjore and part of Trichinopoly District from January 1st, 1915. Mr. R. Lescher will take charge of South Canara from January 15th, 1915. with his headquarters at Mangalore.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Coffee Pruning.

During recent years there has been a growing tendency on some estates to give up the regular pruning and handling of coffee. The crops have apparently in most cases remained the same and the cost of pruning is saved and a considerable amount of labour is set free for other work, hence this system is a tempting one. That it is a good policy, however, is doubtful. I have recently received some most interesting notes on this subject from a planter in the Shevaroys which tend to show that the quality of the Coffee deteriorates when regular pruning and handling are discontinued. In one particular instance an estate is quoted which consisted of old coffee planted 6 x 6, 7 x 7, and 9 x 9 at an elevation of 4,500 feet with a rainfall of 60 to 65 inches. Here pruning was discontinued over a period of about seven years. The consequence was that the place got matted and most difficult to work and the quality of the coffee deteriorated. The crop remained about 4 to 4½ cwt. per acre, but the outturn became almost all C and triage. At the end of this time pruning was again adopted and the quality has been regained and it now fetches a high price.

This seems fairly conculsive evidence. The manurial system adopted was a mixture of Bones, Poonac, and refined Saltpetre and alternate rows were trenched. As this system was not materially altered throughout the pruning and non-pruning periods, however, it would appear that pruning was the prime factor in the alteration of the quality of the coffee.

It is noticeable that on short trees not pruned or handled, after 5 or 6 years the berries on the lower braches do not mature, owing to lack of light and air.

Another important point is that should at any time a scale insect or other disease attack the coffee necessitating spraying it is quite impossible to spray unpruned bushes effectually and under these circumstances the regularly pruned and handled estate will have a better chance of eradicating or controlling the disease than the unpruned one.

A system of non-pruning may be all right for a few years, but I understand that several planters on the Shevaroys regret the day when they gave up pruning and consider that it has set their estates back by three years.

Rubber Experiments

A letter from "C." appearing in this issue, contains a friendly gibe at "the Experimenter," and under the cloak of humour drives home what are undoubtedly wholesome truths.

Probably no cultivated crop is more difficult to experiment with than Rubber as far as the comparison and interpretation of results are concerned. Not only is it difficult to plan experiments with trees which show a great deal of individual difference in yield under the same treatment, but, as "C" points out, the individual tapper has a great deal to do with it. All the difficulties which "C" points out have been discovered by the experimenter on Agricultural Stations, and ways and means have been devised for circumventing them to a great extent, and in this connection I have asked the Editor to reproduce in these pages a very excellent paper on the subject of the correct methods of planning of experiments with Rubber by Mr. Barrowcliff, the Assistant Agricultural Chemist in the F. M. S. Agricultural Department. From this it will be seen that a great deal of preliminary work must

be done, and many precautions taken, if any results are to be obtained which can pretend to be reliable. What "C" has to say emphasises the point made in these notes last week, that the average estate manager cannot reasonably be expected to carry out manurial and tapping experiments and record the observations necessary to make them of value to anyone but himself. It it work which should be done by trained scientists on special agricultural stations.

When such a station does not exist, however, and the staff of scientists to do the work is limited, as is the case at present in Southern India, the question arises as to whether it is better to leave all such work alone and blunder along in the dark and discover things by experience alone after numberless mistakes repeated on estate after estate, or to make some attempt to solve the outstanding problems of tapping and manuring. After all "C" must realise that were it not for experiments knowledge would stand still, and there are many things about Rubber which he will never discover for himself unless he also becomes an "experimenter." I shrewdly suspect that he really is one.

Bananas.

Most planters cultivate more or less a certain number of Bananas round their bungalows and lines, but little attention is paid as a rule to the variety grown. In the *Journal of the Jamaica Agricultural Society* for October, attention is called to the value of the dwarf Cavendish or Chinese Banana (*Musa Cavendishii*) for home consumption. This Banana is neglected because it is not used in the export trade, but its value as a table fruit is great as I can testify from personal experience in the West Indies. It is pointed out in the *Journal* that this variety "can grow on exposed places on steep hill sides and on poorer lands than the tall variety and still produce good bunches." It will grow at high elevations and is hardy and a good cropper and owing to its dwarf size it resists wind and storms better than the ordinary tall varieties.

In a paper on the manuring of Bananas read in the International Congress of Tropical Agriculture, Queensland, Mr. Brunnich, the Agricultural Chemist stated that Potash is the dominant factor. Bananas require a well drained, loamy soil containing a fair amount of humus and good quantities of potash, lime, and phosphoric acid in a readily available form. A good deal of humus is returned to the soil by the stalks of the plant when the fruit has been gathered. The plan of cutting the stalk into pieces is found to be better than allowing it to rot whole. Green crops of leguminous plants were strongly recommended in Banana cultivation provided that they are not allowed to grow too closely round the stools so as to rob the Banana plants of water.

The standard fertilizer, adopted after experiment, for Bananas in Queensland is 320 lbs. Sulphate of Potash, 470 lbs. Superphosphate and 290 lbs. Dried Blood, or 290 lbs. Nitrate of Lime per acre. This is applied twice a year. The first application is made in the plant hole when planting out and subsequent applications are made as a top dressing and lightly dug in. Despite the heavy cost of such a manurial system it is found to give a very profitable return. In the experiments upon which this manurial system was based, Cavendish bananas were used planted 12 feet apart, or 302 stools to the acre.

RUDOLPH D. ANSTEAD,
Planting Expert.

MANURIAL EXPERIMENTS.

The Planning of Manurial Experiments.

By M. Barrowcliff, Assistt. Agr. Chemist, Deartment of Agriculture, F.M.S.

(*The India Rubber Journal.*—Oct. 24, 1914.)

The size of each plot it is suggested should be not less than two acres, and the tapping of each the work of one and the same coolie throughout the course of the experiment. The trees in the area selected should be as far as possible of the same age and should have similar tapping and cultivation histories.

Even after taking the greatest care in the selection it will be found that appreciable, often considerable, differences exist in the yields afforded by the different plots, and it is therefore regarded as a matter of the utmost importance that a record should be kept of the yields for at least six months, preferably a year, before the application of any manure whatsoever. By this method comparison is obtained not only of the difference between the manured and the unmanured plots, but also of the effects of the fertilisers on the yields of the individual plots themselves; and, especially if the results are then expressed in the form of graphs, say, showing the weekly outputs, a much more accurate view is obtained of the extent and duration of the action of the manure than if the usual procedure alone is followed.

As an instance of the necessity of adopting the above plan an experience may be cited in which the difference in yield between the highest and lowest of six plots, all adjacent and of the same number of trees, was no less than 20 per cent. over a period of six months. Now supposing that these two plots had been assumed to be exactly comparable as there was seemingly every reason for doing, and that a fertiliser actually capable of bringing about a 20 per cent. increase in yield was applied to one, the other remaining as a control, it is seen that its apparent action would be according to which plot it happened to be applied.

Amongst the few manurial experiments that, as far as the writer's knowledge goes, have been carried out on estates a considerable percentage have resulted in the control plots affording a higher yield than those manured, and in further experimentation being discredited, a state of affairs very probably brought about in the way just described.

As a digression, the writer may perhaps be permitted to express his opinion that the discrepancies between the results of tapping experiments reported from different stations, no two of which seem to agree, may be due to the same cause also, and to suggest that in future work the yields produced by making one cut only should be recorded for a considerable period before the variations it is desired to test are introduced.

The next point it is desired to emphasise, is that whenever possible a mechanical and chemical analysis of the soil should precede initiation of the experiments.

It not infrequently happens that the agricultural chemist is called in to prescribe a manure for an estate or a backward portion of it when examination shows the cause of the poor yield to be far more fundamental than a deficiency in any of the plant nutrients, that owing to deficient drainage, to

the presence of a hard pan or laterite at shallow depth, or to the soil itself being of a heavy impermeable texture root development is checked, and the tree unable to avail itself of essential elements which may indeed be present in abundant quantity.

In such cases, without first taking the specific measures of improvement required in the particular case, the application of artificial fertilisers could only result in disappointment and loss.

For these reasons it is desirable, and is in the Federated Malay States Agricultural Department insisted upon, that the chemist should himself inspect the land it is proposed to treat, in order that, as far as possible, all the factors bearing on the problem may be estimated.

Furthermore, it should be remembered that it is only when full information regarding the soils is available that experience derived in one place can, with any prospect of success, be applied to another, in fact without this knowledge intelligent interpretation of any results, positive or negative, is difficult, if possible at all.

Great caution should be exercised by planters in applying on any considerable scale a fertiliser represented to have been successful elsewhere. and on the other hand no one should be deterred by the failure of others from making trials for himself.

The following plan of experiment is put forward as being one from which the maximum amount of information as to the effect of the various fertilising constituents is obtainable from the smallest number of plots :—

Plot No. 1—Lime, nitrogen, phosphate, potash.

Plot No. 2—Lime, nitrogen, phosphate.

Plot No. 3—Lime, nitrogen, potash.

Plot No. 4—Lime, phosphate, potash.

Plot No. 5—Nitrogen, phosphate, potash.

Two plots to remain unmanured as controls, but to receive the same amount of cultivation as the others. The amount of each constituent to be the same in each mixture.

If all four constituents are needed by the soil one plot, No. I, will show an increased yield over the others ; if three, it will be apparent in two plots ! if two, three plots will demonstrate the fact ; whilst if one only four plots will show an increase over the fifth and over the controls.

For instance, supposing lime, potash, and phosphate are required, Nos. 1 and 4 will give greater increases in yield than the remainder ; if lime and potash are wanted, phosphate being present in sufficient quantity, the fact will be evident from the yields of plots 1, 2, 3 and 4, whilst if potash alone is required, plot No. 2 and the controls would show smaller increases than the remaining four.

By studying the results so obtained the influence of each individual fertiliser upon the latex flow can be estimated. The rubber and scrap from each plot must be daily carefully labelled, and its dry weight recorded. Each week's output of scrap may be weighed in bulk, but as a check on the tapping coolies it is better to weigh separately the daily sheets of latex rubber and to compare the yields.

For instance, a considerable drop in one unaccompanied by a similar fall in the others of the same day would indicate an accident, or some carelessness.

As the experiment proceeds it will be seen from the weekly and monthly totals the course the results are taking, and if, as advocated below, the application of the manures is made just before the onset of the wintering season a marked effect may be very quickly apparent.

In any case before the end of a year the order and degree of the efficacy of each of the ingredients of the mixtures will be definitely indicated. A second set of experiments should then be initiated on plots previously selected and whose yields have been recorded, in which the fertilisers shown to have only a slight effort or none at all are excluded, of the others one combination only should be selected, this also based on the degree of potency disclosed, and applied on a value basis of $5, $10, and $20 per acre, extending to higher amounts, if thought desirable, to different plots.

The former trials having shown the manure applied; this second series will demonstrate the amount in which it can be most profitably used.

For estimating the effect on bark renewal it may be thought advisable to continue the original experiments, renewing the fertilisers every other year, until definite results, positive or negative, are obtained; but probably the plant foods found best to stimulate latex flow will also prove to be those most beneficially affecting the general health of the tree and its bark renewing capacity.

In the original experiments the lime should be supplied in a quantity of $\frac{1}{4}$ to $\frac{1}{2}$ ton per acre according to the nature of the soil. The proportions of the other ingredients would best be defined by the chemist as a result of his examination of the soil, but in the absence of any marked deficiency or abundance of any one a ratio of nitrogen; potash: phosphate 1: 2: 2 may be suggested.

The cost of the complete manure excluding lime, should however not exceed $20·00 per acre; the total cost, including liming and applications would then be not much more than $30 per acre in the case of the most expensive mixture, and would be more than recouped, at the present price of 2*s*. 6*d*. per lb., by an increased yield of 40 lb. of rubber.

The above suggestions are intended to apply to normal soils, on which ammonium sulphate, concentrated superphosphate, and potassium sulphate may be employed as the sources of nitrogen, phosphate, and potash respectively.

In special cases additional experiments with other fertilisers would be recommended. For instance, a peaty soil would be expected to benefit by heavier liming and the application of potash manures, a clay by basic slag, perhaps to the exclusion of potash, whilst on sandy soil organic sources of nitrogen, such as oil-cake, might reasonably be expected to prove of greater service than sulphate of ammonia.

As regards the time at which the fertilisers should be applied, there is no doubt that it should be about a month before the commencement of wintering, the season of physiological drought, it being in the prevention of the fall in yield experienced in most places at that time that the effect of the manures is most obvious.

MANURES AND MANURING.

The Supply of Potash.

The cessation of exports from the Stassfurt Mines in Germany, which constitute the principal and practically the only source of ordinary potash manures, raises the question as to what substitutes can be employed in the near future, and from what quarters these can be obtained.

For many years a considerable amount of work has been done in the United States and elsewhere with a view to rendering available the potash which is contained in certain well-known and widely distributed varieties (*e. g.*, orthoclase) of the mineral called felspar. It will be remembered that this substance is a common constituent of many soils, as well as occurring in vast quantities in certain rocks like granite. Trials have shown that it is not a paying operation to manufacture available potash from felspar for the sake of the potash alone. The discovery, however, that Portland cement can be obtained by the treatment of felspar with lime as well as available potash, as a by-product, has of recent years rendered the idea practicable, and indeed, several factories have been established for carrying out these operations. At the same time the unit price of potash from this artificial source is greater than that of the mineral obtained from natural mines, and up to the present this artificial supply has been altogether inconsiderable. There is reason to suppose now, however, that owing to the complete cessation of the German supply which, as already intimated, has held a world monopoly, some possibility exists that a rise in price may render the artificial production of potash fertilisers feasible,—a circumstance of importance to those who are engaged in production of certain crops.

Another alternative in the present situation might be to take advantage of the Indian supply of saltpetre (potassium nitrate). In 1906-7, India exported principally by way of Bengal, 353,378 cwt. of nitrate of potash, valued at Rs.4,152,527 (£276,168). The largest quantities of this amount were distributed in order of nomination to the United States, United Kingdom, China (Hong-Kong) and Mauritius. The average value per hundredweight of Indian nitrate of potash for the five years preceding 1907 was 14·5*s*.

In connection with the information just given it may be of interest to add a few words on the chemistry of nitrate of potash. It is obtained in India in the form of an efflorescence at the surface of the soil, and the conditions for the formation of the salt are briefly as follows: Supplies of nitrogenous organic matter; climatic conditions favourable to the growth and action of nitrifying bacteria which convert urea and ammonia sucessively into nitrous and nitric acid; the presence of potash; and metcorological conditions suitable for the efflorescence of the potassium nitrate at the surface. This necessary combination of characters is to be found in a marked degree in various districts in the Indo-Gangetic tract.

It is well known that nitrate of potash has an important use in the manufacture of explosives, and it is a further point to anticipate whether the Indian Government has not already prohibited the exportation of nitrate of potash under the category contraband of war, in which case it would seem that agriculturists will have to look to either artificial mineral supplies as dealt with in the first paragraph of this article, or rely upon the practice of carefully returning plant débris and wood ashes to the soil. Careful attention to this latter procedure should ensure adequately all

necessary demands for potash. It may be noted, however, that there are one or two by-products of tropical crops in existence which are very rich in potash and may possibly come into use as an organic-potash manure, for example, Senat seed from the Soudan, the ash of the husks of which is rich in nutrients containing as much as 42 per cent. of potash (K_2O). Material of this kind as well as sea-weed (also rich in potash) should prove very valuable.

Nitrate of potash is not used largely as a manure as it is rather expensive. For sugar-cane in Barbados, however, and in other islands where the soil has to be kept rich in available plant food, nitrate of potash has proved useful and possibly economical because nitrogen being required as well as potash, the planter has in this manure two essential elements in a readily available form. Owing to the richness of nitrate of potash, its purity and complete availability, it is necessary to use only small quantities per acre, for example ½ cwt., which is significant as regards freight.

The usual guarantee for nitrate of potash is 17 per cent. nitrogen and 40 per cent. of potash, the unit prices for which are quoted at 14*s.* 6*d.* and 3*s.* 9*d.*, respectively.—*The Agricultural News.*

The trade relations of India with Germany and Austria-Hungary are of special interest at the present time. The report on the Trade of India for 1913-14 shows the rapid increase of Germany's trade. Mr. Findlay Shirras states that German trade with India has increased, costly British goods being largely displaced by German cheap manufactures. The German manufacturers have secured special advantages by the application of technical skill, chemical science, or a combination of both, in the supply of certain goods, such as musical instruments and mineral dyes from coal tar. The development of German shipping has also encouraged direct imports from, as well export of, cotton, hides, jute, oil seeds, and rice for manufactures to Germany. Cottou manufactures, dyes, iron and steel machinery and woollens bulk in the import trade. The substantial improvement in exports is chiefly due to increased shipments of raw jute and cotton, and seeds. The exports to Germany in the year under report amounted to Rs.23,18,00,000 in value, and the imports from Germany were valued at Rs.7,52,00,000. Imports of sugar and glass-ware from Austria-Hungary increased, as did exports of raw jute and cotton, and hides and skins. The value of the imports from Austria-Hungary was 429 lakhs of rupees, and the value of the exports to that country was 997½ lakhs of rupees. In 1904-05 the value of imports from Germany formed 3·2 per cent. of the total imports into India; in 1913-14 it had risen to 6·9 per cent. In the same period the percentage of exports from India to Germany rose from 9·2 to 10·3 per cent. Imports from Austria-Hungary were 4·1 per cent. in the former year and fell to 2·3 per cent. in the latter. Exports to Austria-Hungary in the same period rose from 3 per cent to 3·9 per cent of the total exports. In the same period imports from Great Britain fell from 65·2 to 64·1 per cent., and exports to the United Kingdom fell from 27·7 to 23·7 per cent. The export trade to Germany and Austria-Hungary will have to find another outlet, at any rate while the war continues.—*Indian Planters' Gazette and Sporting News.*

The Board of Trade are informed that the Chinese export duty on tea was to be reduced, as from the 1st November, from 1,250 tael to 1 tael per picul.—*Capital.*

RUBBER.

The Thinning out of Hevea Rubber Trees.

By E. B. Skinner.

(*Continued.*)

In view of the excellent results obtained by contract or bonus tapping, we may also look at the matter in another way. On a widely planted estate, though a coolie has to take a few extra steps between each two trees, he has to make fewer cuts to obtain his given amount of rubber; he has fewer spouts to clean, fewer cups to wash, fewer cups to put into position for the collection of latex, and fewer shavings to collect. It follows, then, that he may be expected to bring in more rubber as a daily task from a widely planted estate than from a closely planted one, and hence there is also a great saving in the cost of collection. We may take it that fewer coolies are required to produce the same amount of rubber where the trees are widely spaced, and fewer coolies means a smaller wages bill and a lower f. o. b. cost.

Other economies also result. On the basis of an acre bearing, say, 70 trees yielding as much as one bearing, say, 150 to 200 trees, an enormous saving is effected in the outlay on cups and spouts. This is so patent that we need not go into calculations of the cost of one cup or one spout, and multiply by 70 or 200 to show exactly what is saved. It is quite certain that a great deal of expense is saved on spouts and cups, meaning an appreciable amount per pound of rubber.

Under present market conditions the proportion of No. I rubber to the other grades is a very important question. A few trees produce a large quantity of rubber, and fewer spouts are required, so the quantity of scrap rubber is reduced. The same is true of cup washings and shavings, since fewer cuts and cups are required to collect the same quantity of rubber. Hence a higher proportion of No. I rubber to the total crop, and a larger average price realised.

It must certainly have fallen within the experience of some planters that weeding has become more expensive where an area has been freshly thinned out. More light penetrates to the ground, and in consequence more seeds germinate, and a larger crop of weeds is the result. We have always found that the cost of weeding has gone up after thinning out has taken place, but we have never found this effect to be other than temporary. On a well-weeded estate such a flush of weeds is very easily controlled, and if the newly-grown weeds are not allowed to seed, the cost should not increase for more than one month or so, after which the increased spread of the branches produces shade, and hinders the growth of the weeds. Where the weeds are not removed the mischief is, of course, more serious, though even here the rapidly increasing spread of the branches of the remaining trees would tend to check the weeds in time.

We may say, then, that by thinning out fewer coolies are required to produce each pound of rubber, fewer cups and spouts are used, less low grade rubber is produced, and expenses (except sometimes temporarily for weeding) are substantially reduced in many directions. From our experience it seems undoubted that the latex of well renewed bark from widely spaced trees yields a much higher percentage of No. 1 rubber than the latex from closely planted trees. From the evidence we have been able to collect so far, the difference appears to amount to not less than 10 per cent.

Having now considered the effects of thinning out, *we may turn to the actual process of cutting out the trees.*

There is a prejudice on some estates in favour of cutting out geometrically, so as not to interfere with the regular arrangement of the trees. Something may be said for this method, and in the case of untapped trees it may be the best, but to my mind that of cutting out by selection is the only sound one. Even cutting out by selection may, however, be based on two different principles, for trees may be judged by their appearance or by their yield. The presence of excrescences on the bark, a poor-looking head, interlocking of the branches with neighbouring well-grown trees, a bad arrangement of branches, making a tree liable to be split by winds, are better reasons for removal than the position of a tree in the row. I think, however, that generally the prime factor in deciding the fate of any given tree should undoubtedly be its yield. This can be ascertained roughly by careful observation on the part of the assistants in charge of the tapping, with the co-operation of the tapping coolies, but with greater experience in the matter convenient methods of selecting trees by their yields will, we hope, be worked out. Although selection, however, should be primarily based on yield, general considerations of spacing should not be entirely neglected when thinning out is undertaken. When all the very poor yielders on the one hand, and all the very good yielders on the other hand have been picked out, there will always remain a mass of mediocre trees which can probably be most conveniently dealt with by general considerations, at all events until such questions as the inconstancy of yield from certain trees have been examined. The question of the simplest and most accurate method of ascertaining the yield of individual trees for purposes of thinning out is an important one, which ought to receive a good deal of consideration in the future.

Of course, the best method of thinning out for one area may not necessarily be the best for another. Take as examples an evenly grown young clearing that is to be thinned out before it comes into tapping. In such an area selection by appearance and yield would not be so applicable, and the method of cutting out geometrically would obviously be the best to apply. Compare this with, say, an old area on which the trees had been planted at 10 ft. by 10 ft., and on which they had been too severely pruned. It is obvious that in this, as in all other planting questions, common sense must come to the aid of the rule of thumb, and a knowledge of the experience of other estates on the same question is likely to be invaluable.

Another interesting question is whether trees should be cut out straight away, or should first be pollarded and tapped till they cease to yield. When thinning out first began to claim attention, the natural anxiety, and slight distrust of its effect on the yield per acre, felt even by its most enthusiastic advocates, led to the desire to get as much as possible out of the trees before they were removed. They were therefore generally cut off at about eight feet from the ground, and tapped for several months until they ceased to yield. This method is no longer adopted, and I think, rightly, for the following reasons:—

(1) It is cheaper to have the tree cut out once and for all than to have it first cut off at eight feet, and later on cut out completely.

(2) The yield from a pollarded tree, deprived of all its food-producing branches, and dependent only on the tuft it throws out at the end of a sucker, and overshadowed by its neighbours, must necessarily decrease very rapidly as the tree quickly becomes exhausted. In most cases the yield, even at best, barely covers the cost of tapping, collection, etc,

(3) The yield of the remaining trees is now proved to increase so rapidly, in areas where thinning out is done in good time, as to more than compensate for the loss of yield from the pollards, and the supply of food in the ground is left for the good yielders, instead of being partially appropriated by the poor-yielding pollards.

(4) Where pollards are tapped, it is almost inevitable that both assistants and tappers, knowing that the pollards will soon be cut out, should become careless about the standard of work done on them. I have known the whole standard of work on an estate to deteriorate temporarily owing to bad work allowed on pollards.

I think, therefore, that it is the better policy to cut out the trees to be thinned out at once, rather than to pollard and tap them first.

The next question I will consider is :—

When should thinning out begin, and at what pace should it proceed ?

As a general rule I think that some form of planting should be adopted which will give approximately 100 trees to the acre. Of these 100 trees planted, probably only 60 or 70 trees will be large enough to tap when tapping begins. This means that a good many of the trees are backward, and are therefore never likely to do any good, and in such a case it would be advisable, in my opinion to have them reduced by selection, by the time tapping begins, to about 80 to the acre. After this careful observation of the yield and general conditions should continue, and the cutting out of individual trees should go on from time to time.

On a thickly planted estate the rate at which thinning out should proceed depends entirely on the condition of the trees and their bark. If the bark renewal is already very bad, and the yield is also very poor, the best course, in my opinion, is undoubtedly to cut out at once to about 70 to the acre. If, however, the trees are only beginning to show signs of overcrowding, such as loss of branches and a tendency to poor bark renewal, it would possibly be better to reduce them first to 80 or 90 to the acre, and afterwards, by careful selection, to a small number. What the smallest number per acre may be to which under any given circumstances it might be advisable to reduce the trees, is a matter for the future to decide.

In discussing the question of the economies effected by wide planting, I said that the yield per acres from a widely planted estate is as great as, or greater than, from a similar area closely planted. This does not apply to its full extent to the first two years of tapping. During these years, although the branches may already have been interlocked, the full effects of close planting have not yet been felt, and therefore the yield may be greater than from a more widely spaced area. But a high yield in the first and second years, owing to close planting, inevitably endangers the health and yield of the trees in say the seventh and subsequent years, when the estate should normally be increasing annually in value, owing to the early increase in yield, and the possibility of effecting great economies in working.

Even if thinning out began in the second year of tapping in well grown areas the remaining trees would almost certainly have suffered already, and their yield in future years would have been injuriously affected.

I think, therefore, that it is infinitely the better policy to sacrifice a small increase in the crop in the first and second years, for the sake of the subsequent prosperity of the estate. The large question of the amount of working capital required enters in here, for under-capitalised estates may, of

course, urgently require, the extra crop during the first and second years' tapping, but the subject of capitalisation is hardly relevant to our present discussion.—*The India Rubber Journal.*

Rubber Shipments to France.

The Rubber Growers' Association have communicated to the Press copies of correspondence which has passed between them and the Foreign Office in regard to the French import duty upon indirect rubber shipments. As is well known, France has been accustomed to levy a *surtaxe* upon imports of transhipped raw materials. The Rubber Growers' Association informed the Foreign Office of the difficulty of making shipments from the East direct to French ports, and pointed out that the imposition of the tax was inflicting considerable hardship upon rubber companies, many of whom have still to carry out forward contracts. They added that apart from this, the *surtaxe* would eventually fall upon the French consumer. Though the Association was aware that at the instance of the British Chamber of Commerce in Paris, the French Minister of Finance had consented to extra-European goods, which were prevented by the war from being shipped direct to France, being imported after transhipment in a British port without payment of *entrepot* surtax usually levied on transhipped goods, they understood that this facility was subordinated to certain specified conditions which would be made public later. In the absence of any further public announcement at present, the Association suggested that if the French Government were approached through the British Foreign Office on the matter and the circumstances explained to them, the authorities would realise the position and concede an unrestricted suspension of the surtax in respect of rubber shipments until shipping facilities again became normal.

The Foreign Office replied to this communication by sending a copy of a letter which had been addressed to the London Chamber of Commerce. In this it was stated that a despatch had been received from His Majesty's Ambassador at Bordeaux reporting that he had been informed by the French Government that the products of British colonies imported into France *via* the United Kingdom would be exempted from payment of the *surtaxe d'entrepot.*

The exemption is conditional on the production of the original bill of lading, and of a certificate of supervision from the British Customs: in case such supervision has been interrupted and the goods have been warehoused, the certificate must take the form of a guarantee that the goods have remained properly sealed. The Foreign Office added that there was no prospect of persuading the French Government to waive the conditions specified, and that they could not approach the French Government in the matter.

As there is no option but for rubber now being shipped from Malaya and Ceylon to come to the United Kingdom, it seems hard that the *surtaxe* should still have to be paid. There is, however, a ring of finality about Sir Edward Grey's statements, and it will be felt that this is no time for criticism. A somewhat similar situation has arisen out of the system of transhipments to America under guarantee from buyer. Here the question is who shall pay the extra charges involved. We believe that the matter is being arbitrated upon.—*The India Rubber Journal,*

CORRESPONDENCE.

Estate Tapping Experiments.

THE EDITOR,

Planters' Chronicle,

Bangalore.

Dear Sir,—A few years ago, when the rubber tree was something of a mystery and planters were ever on the watch for epoch-making discoveries, it was one's luck or fate to come across rather frequently of a week end, the *Experimenter*—that honest and optimistic enthusiast who would proceed to convince one by means of rows of perplexing comparative figures that (to mention a few devices) by changing over from segment to segment, tapping at stipulated hours, at particular intervals, with this or that number of cuts, arranged in devious patterns, Hevea Braziliensis could be made to yield latex in quantities that to simple folk appeared to be startling.

The usual procedure in these experiments was to select at random certain plots of 30 or 40 trees each and to keep records of the yields from each plot: to allow 5% for possible error and to put the work under the direct supervision of a Writer and the general survey of an S D who might also have 400 acres of other tapping to look after in addition to numerous lesser works. Small wonder, therefore, that results were sometimes surprising. An S D knows that a Division of tapping well carried out is worth more to his ambition and the eye of his V. A. than a few experimental plots. He knows very well the things that may be done in the name of tapping by Ramaswamy and his tribe, if slackness is allowed to creep into a division. If a thorough man he realises the futility of attempting to ensure against irregularities in the tapping of the Plots, the collection of the latex and its subsequent treatment by giving the small amount of time which he can ill spare in a strenuous day, to perhaps, one of the processes. Hence the Writer, relieved of more arduous duties, comes into his own, since experimental plots are always conveniently placed nor is it usual to train raw coolies on trees so sacred. It is too good a billet to lose. Results desired must be ascertained and in due course are obtained. A Writer can be relied on to please his employer even to the extent of mixing a little latex.

In true planting spirit figures have found their way into print from time to time, yet somehow we have not been moved to depart very much from old principles. The more elaborate the idea the more we have striven to simplify the type of knife and the methed of working the trees, to realise the importance of the human factor, to get as quickly as possible from a short term untrained cooly full value for his work.

The old idea seemed to be that Ramasawmy too dense to learn, must be given a knife of weird and intricate design, fully protected and warranted to prevent the making of wounds. The knife certainly fulfilled its purpose and if the cooly did not manage to hit the latex cells, he lost no pay for deep cutting. Moreover, Ramasawmy, ever inquisitive, loved to "take down" the nuts and springs and safety blades and to omit those parts which seemed unnecessary. Still, the improvement in tapping and the change in ideas has left a few regrets. It was pleasant to pull the knife along the channel removing in bark that which is now considered sufficient for 10 days. To put in cut after cut on the stem of the tree and to see 16 tributaries of latex flowing into one main river. There should be a tapping knife museum for future generations of S. D's will have to rely on the picture in old tool catalogues to realise the difference between those irresponsible days and these troublous times of basal V's and bark allotted like explorers rations.

Yet I fancy it was that ancient mother of invention, rather than the Experimenter, who taught us to economise the bark and to find a knife for the purpose.

Present methods rely more on the skill and intelligence of the cooly and less on patents but still the personal element is a factor. Two coolies may have the same amount of training and yet obtain for a long time very different results. One man has the knack, has found his "touch," while another is forcing the knife and stopping up the latex cells. To outward appearance the tapping is the same. Yet Plot A allowing 5% for error is found to give better results than Plot B—in decimal points, which evolved from 50 tree plots thousand acre yields, interest on capital and dividends to lucky shareholders may become traps for the unwary.

Yours faithfully,
"C."

THE EDITOR,
Planters' Chronicle,
Bangalore.

Dear Sir,—Both my Assistants being away on service, I have perforce to rely solely on Writers. To simplify matters I have requested them to send me a daily forecast of their next day's work in each division. This is one "Most respected Sir, I most humbly beg to inform Master that to-morrow about 75 men will be weeded in No. 6 Field, and 55 women will be weeded in No. 4 Field. 2 sick tree coolies will be worked in No. 7 Field, yours etc." That last sentence sounds ominous.

Will Mr. St. George of Haileyburia give us his present tea yields which are very startling? Giving age of the Fields etc.

Yours faithfully,
"OPTIMUM QUOD PRIMUM."

A CHEERFUL VIEW DESPITE THE SHADOW OF WAR.

Mr. Lampard speaking at the Rubber Trust meeting, almost on the eve of declaration of war, in reference to the threatened outbreak of hostilities between England and Germany and the outlook for those interested in the Trust's operation said:—

"While under surrounding circumstances, and with the shadow, possibly, of something which we all do not like to think about, it is very difficult to speak cheerfully of anything, still I do believe that we may regard this threatened danger as a temporary thing only. I absolutely refuse to believe that the whole world is going to allow itself to be involved for the transgression of one petty State, which would penalise the people of every civilised country. I do not believe that, and, therefore, having that conviction, I am able to take a cheerful view of our holdings and the prospects which are before us. They have not altered at all. We shall get a good profit out of tea; we shall get an excellent profit out of rubber, and the only thing which it is necessary for you to do is to be reasonably patient until the policy which we have pursued has had an opportunity of showing itself. (Hear, hear). We have not invested your money in properties with a high acreage cost. We have kept steadily before us that it must be a low acreage cost if we are going to walk on safe ground. We have done that throughout. As I have said, there is the penalty of waiting, but the reward is that in the end our capital is safe."—*Greniers' Rubber News.*

The Planters' Chronicle.

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(INCORPORATED.)

Contents

We do not publish anything from the Scientific Department this week, as Mr. Anstead went to Madras, and only returned yesterday.

The Proceedings of a special General Meeting of the South Mysore Planters' Association are printed.

From the *Ceylon Times* we take an article supplied to us from the Labour Department on a practicable method of destroying flies. At certain times of the year, flies become a perfect plague and nuisance, and we recommend the method suggested for getting rid of them.

We publish a long letter from Messrs. Brooke Bond & Co., Ltd., to the Editor of the *Indian Planters' Gazette*, which will be read with interest by the tea planters in Southern India, and the tables of the four seasons showing the exports from India to various countries, will be found useful. The paras. dealing with the various tea-growing countries, is instructive.

From the *India Rubber Journal* we extract an article on "The Rubber Export Prohibition." The para. dealing with Labour on Rubber Estates, deserves attention.

It is noticeable that the latest Consular report shows that while in 1913 there were imported into Italy *via* Naples and neighbouring ports 287 tons of pepper, 2,692 tons of castor oil seed, 366 tons of linseed, and a large quantity of cotton from British India, the supply of coffee for that country imported through the same ports amounting to 2,856 tons all came from Brazil and none from India. There seems to be an opening here for Indian coffee, which might be worth enquiring about.

The Director of the Labour Department writes us as follows:—"The Secretary and Treasurer of the Bank of Madras has kindly consented to have all cheques drawn by European Officers of the Department cashed at all branches and out-agencies of the Bank without charging any discount." The thanks of all subscribers to the Department are due to the Madras Bank for this concession.

DISTRICT PLANTERS' ASSOCIATIONS.

South Mysore Planters' Association.

Minutes of a Special General Meeting held at the Chickanhulli Travellers' Bungalow, on 28th November, 1914,

PRESENT.—Messrs. J. G. H. Crawford (President), H. F. Anderson, A. Hill, S. Sladden, M. J. Woodbridge, V. Scholfield, St. J. Hunt, K. T. Seshaya, C. K. Pittock, C. Lake, E. W. Rutherford (Honorary Secretary.)

The President in the Chair.

Minutes of last Meeting.—Resolved that the Minutes of the previous meeting be passed with the exception of the resolution on Rule No. 9, which resolution be circulated previous to the next Annual General Meeting for confirmation.

Proposed by Mr. M. J. Woodbridge.

Seconded by Mr. K. T. Seshaiya.

Report of the Delegate to the Dussera.—Mr. J. G. H. Crawford read to the meeting his address to Government, which was as follows:—

To

M. VISVESVARAYA, ESQ., C. I. E.,

Dewan of Mysore.

SIR,

I have been instructed by my Association to bring to the notice of the Government of His Highness the Maharajah of Mysore and to respectfully impress on them the vital necessity for the introduction of a Pest Act into this State in view of the fact that our industry is seriously threatened by an insect (*Lecanium viride*) that has done such incalculable damage to coffee estates on the Nilgiri and Palni Hills, the earlier an ordinance can be placed on the statute books, the better, in order to immediately cope with and bring under control this pest before it gets out of hand or causes irremediable damage. The Act might be modelled on that of the United States of America and made to apply from time to time to such portions of the coffee planting zone as were found to be infected and a notification to this effect could be published in the *Mysore Gazette* giving details of the area proscribed.

The subject of the Arsikere-Mangalore Railway has been brought to the notice of His Highness the Maharajah's Government so many times and its supreme importance to the Mysore State as a connecting link with the West Coast is so obvious that I will only venture to ask that the early construction and completion of the same may have the Durbar's most serious consideration.

Roads and Communications.—Owing to the want of rain during a portion of 1913-14 when the D. P. W, and Local Fund Boards should have undertaken the repairs of the highways in the Malnad and Maidan parts of the Hassan District the work was unavoidably neglected and several of the roads, particularly those under the charge of the District Boards and the Hassan-Arsikere road, fell into a very bad condition. Lately, however, in the Malnad portion of the Hassan District restoration works have been put in hand and a considerable improvement effected. This we trust will be continued generally and the roads maintained in as high a site of efficiency as possible. In conclusion I desire to express on behalf of my Community

to His Highness the Maharajah our high appreciation of his magnificent act of generosity to the Imperial War Fund. His Princely gift and the noble sentiments that prompted it will ever be remembered as typical of the traditional generosity of the illustrious House ruling this State.

(Signed) J. G. H. CRAWFORD,
President,
South Mysore Planters' Association.

September, 1914.

He then addressed the Meeting, saying :—

GENTLEMEN,

I had the honour to represent you at the last Dussera meeting, and was instructed to bring the following subjects to the notice of the Mysore Government. (1) Scientific Department and interview with the Dewan *re* increased support. (2) Title Deeds and the hardship of having to pay back tax on one rupee tenure land if the purchaser wishes it placed on the permanent assessment. (3) Pest Act, Roads, Arsikere-Mangalore Railway. These latter were brought up in an address I gave in open Durbar, to which the Dewan replied in a general speech acknowledging all the addresses. He said " As regards the roads, the P. W. D. has been handicapped by fitful rainfall both last year and this season, but efforts are being made to maintain every road in as efficient a condition as its importance demands. The question of the introduction of the Pest Act raised by the representative of the S. M. P. A. is under investigation. " The Dewan's reply to Nos. I and 2 is placed on the table. I might add that owing to the great press of business at a time like the Dussera it is extremely difficult to obtain an interview, the officials' time being almost exclusively taken up by the Representative Assembly. I found the Government courteous and in the main in sympathy with our aspirations.

After the Delegate had answered several questions put him by the members present, a unanimous vote of thanks was passed, for his trouble in representing the Association. The business of the day was proceeded with.

Roads.—Letter from the Executive Engineer, Hassan District, read.—The Honorary Secretary was directed to write to the Executive Engineer, Hassan District, and point out that Planters in the Hassan District might be willing to take contracts for the repair of Roads if said contracts were lump sum ones (as it is understood men in the Kadur District have been given contracts) and not, as are offered in the Hassan District, piece-work contracts under which system none of our members are prepared to help.

Gift of Coffee to Troops.—Members were unanimously willing to do their best to help in this way.

Revision of Rules.—Mr. C. Pittock opened the discussion on this subject and pointed out how necessary it was that this matter should be gone into. He kindly gave the Members present a resumé of some of the Rules that particularly wanted altering, and pointed out where he thought that they could be altered with benefit. This enabled members to discuss matters, so that a Sub-Committee would have some basis to work on.

Messrs. M. J. Woodbridge, C. Lake, and C. K. Pittock were elected as a Sub-Committee to go into the old Rules and revise them, and lay their report before members at next meeting.

Co-operative Purchase of Manure.—Mr. C. K. Pittock, a Member of Sub-Committee, explained that owing to the present crisis nothing can at present be done further in the matter. Members in thanking the Sub-

Committee for what they had done, expressed a wish that they would see their way to still hold their appointment, as though matters had to stand in abeyance for the time being, still it was hoped that the crisis would soon be over and then those who had all the facts at their finger ends would see their way to resume their labours, which they would be better qualified to do than any others, who would have to do all the spade work over again.

After a vote of thanks to the Chair the meeting closed.

(Signed) E. W. RUTHERFORD,
Honorary Secretary.

TEA.

Indian Tea.—A further marked advance took place at the public sales. Only a moderate quantity was offered, and it is now evident that before fresh supplies sufficiently large to relieve the position reach the country prices will be still higher. A large business has been done, and stocks have been turned over rapidly. At Wednesday's sale there was practically nothing in Leaf Tea to be had under 9*d.* per pound, only one or two lots of Common Pekoe Souchongs having been sold at 8½*d.* Pekoes between 9¾*d.* and 10*d.*, and leafy Broken Pekoe Souchongs were in strong request. Tippy teas were also exceptionally firm, and although Broken Pekoes have participated to a certain extent in the rise, they undoubtedly show the best value of any grade at the moment. At the sale held in Calcutta on the 27th instant, 17,500 packages were offered. The market was dearer for all descriptions.

Ceylon Tea.—With continued small supplies this market is again dearer. Bidding at the auctions on Tuesday was extremely animated, and it was impossible to buy Tea of any grade except at an advance. In both Whole-Leaf and Broken kinds very little was obtainable under 9¼*d.*, but Dusts and Fannings were unchanged. At the public sales 15,522 packages were brought forward, nearly all of which were sold. Next week the quantity in type amounts to only about 6,000 packages, an unprecedentedly small amount, and a further advance in prices may be expected, particularly as the wholesale trade is very bare of stock.

China Tea.—Supplies continue very restricted, and the quantity now available on the spot is small. A fairly large business has been done in Monings "to arrive" at strong prices. Better grade Ichangs and Kintucks have attracted more attention, as it is generally thought that these kinds will be scarce and dearer.

Java Tea.—There was a small sale on Thursday, when firm to dearer prices were paid for all kinds. Leaf Teas were in strong demand, and very high rates resulted.

LONDON TEA RETURNS.

	Duty Paid.		Export.	
	1913.	1914.	1913.	1914.
	lbs.	lbs.	lbs.	lbs.
For week ended October 24th ...	5,812,560	5,714,084	1,562,460	3,580,925
For 43 weeks ended October 24th ...	226,690,216	238,616,895	46,297,058	51,520,073

—*The Produce Markets' Review.*

LABOUR DEPARTMENT.

Kill that Fly.

A Practicable Method of Destruction.

Sanitary authorities have of late laid much stress on the connection between the house fly and disease, and suggestions have been made to deal with the problem by preventing as far as possible the propagation and increase of the pest. These have been of a general description, more or less the keeping of dwellings and the land round them clear of the organic refuse in which flies lay their eggs.

Among important suggestions made were that such matter should be buried or burnt, or removed to a distance of one mile or more from inhabited houses. Distance, however, has proved no obstacle in the case of the house fly in our suburbs which have been proved to fly long distances. The burying or burning of useful fertilising matter is not favoured by the householder who possesses a flower garden or the market gardener who cultivates vegetables. Any method of dealing with the fly without destroying the matter in which it breeds is therefore worthy of consideration.

The search for a practicable method of destroying the larvae of the house fly has been brought to a successful issue by the joint labours of Messrs. F. C. Cook, R H. Hutchison, and F. M. Scales of the United States Department of Agriculture, an account of which work is published in Bulletin No. 118 of the Department. Not only were the experiments carried out in a thorough fashion, but the results obtained were conclusive.

By means of borax (Sodium borate), we are told the fly nuisance may be greatly mitigated. The treatment consists in adding 0·62 lb. of borax, or 0·75 lb. of calcined Colemanite (crude calcium borate) to every 8 bushels (10 cubic feet) of manure immediately it has been collected from the stable or byre. After the addition of borax 2 to 3 gallons of water should be sprinkled over the heap. The borax should be applied particulary round the outer edges of the pile by means of a flour sifter or other fine sieve. If this be done all eggs deposited in the heap are prevented from hatching. Since the maggots congregate at the outer edges of the heap most of the borax should be applied there. The treatment should be repeated with each addition of manure. Needless to say refuse of all kinds may be treated in a similar manner and also the floors and crevices in stables, barns and stys. Once the necessary amount of borax has been weighed out in a measured vessel no further weighing is required. Experiments made by the authors show that when treated with the above-named amount of borax manure loses none of its fertilising properties. Nor does the borax in this amount produce any harmful effects on the growth of plants dressed with the treated manure. Its effects were tested on many crops, wheat, tomatoes, beets, beans, radishes, kohl rabi, oats, corn, cucumber, lettuce, apple, seedlings, and rose. In only one case—that of wheat—was there the slightest sign of damage to the plant, and in that case the damage—a yellowing of tips—was but transitory. To be on the safe side, however, the borax treated manure should be used at a rate of not more than 15 tons to the acre.

Municipalities and Local Boards might experiment with the method, which should be made as widely known as possible. Borax is extremely cheap and if as claimed it is effective, its use should become general in field, garden and household. Besides the larvae of flies those of other injurious insects, like the Cockchafer and other beetles which deposit their eggs in manure, could be destroyed: while rubbish in which the Rhinoceros Beetle of the coconut palm and other insect pests oviposit might also be treated with advantage.—*Ceylon Times*.

TEA.

Tea in 1913-14.

To the Editor,

Indian Planters' Gazette,

Sir,—The year 1913-14 has been emphatically a planters' year. Demand has increased and producers have responded to the demand, but at enhanced prices. The average price of Indian tea during the season touched a higher point than at any time since 1894-95 and other teas have also risen in price. The consumer has, however, continued to receive the same quality at the same price as before. The loss has been borne by the distributor, whose profits have diminished greatly, while those of the producer have increased.

In other respects, until the outbreak of the war, the history of the Tea Trade has been much as for the last two or three years. There has been the usual disturbance of trade for about three months before the declaration of the Budget, caused by the uncertainty as to whether there would be any alteration in the duty. Your readers are probably aware that the tea-tax is imposed afresh every year and for one year only. There have been the usual letters in the press pointing out the benefit that would accrue to every one concerned if the duty could be fixed, say, for five years, but so far these letters have produced no more effect than in any previous year.

It is impossible to obtain absolutely exact figures as to the amount of tea grown in the various countries of production, but the quantity exported increased during the year from 750,000,000 lbs. to 754,500,000 lbs. This increase is not as large as was expected.

The *Indian* crop again surpassed that of any previous year, exports from that country being about 10,000,000 lbs. above those of 1912-13, which, however, were 20,000,000 lbs. greater than those of 1911-12. Weather was not uniformly favourable, the Dooars being the only district whose yield was exceptionally good in quality and quantity.

The largest consignment of tea ever brought to this country in one ship, *viz.*, 54,362 packages (about 6,000,000 lbs.) arrived in the *Collegian* on 3rd October of this year from Calcutta and Colombo.

The following table gives the distribution of the exports from India during the last four seasons :—

	1913-14. lbs.	1912-13. lbs.
United Kingdom	197,130,000	189,250,000
Australia	9,760,000	9,340,000
United States and Canada ...	8,200,000	7,950,000
Russia	45,100,000	42,740,000
Other ports	13,100,000	14,700,000
Total from Northern India ...	273,290,000	263,980,000
From Southern India ...	20,892,100	20,161,500
Total from all India ...	294,182,100	284,141,500

	1911-12. lbs.	1910-11. lbs.
United Kingdom ...	... 183,739,000	174,100,000
Australia	... 10,098,000	9,596,000
United States and Canada	... 7,808,000	5,607,000
Russia	... 31,394,000	40,347,000
Other ports	... 12,672,000	10,478,000
Total from Northern India	... 245,711,000	240,128,000
From Southern India	... 18,985,100	18,617,700
Total from all India	... 264,696,100	258,745,700

The greatest proportionate increase is in the quantity taken by Russia, as was also the case last year. Russia continues to be India's best customer outside the United Kingdom. In addition to largely increasing her purchases of leaf tea, she took 2,000,000 lbs. more dust than in any previous year.

The *Ceylon* crop was also somewhat larger than last year's. Considerably more tea was exported from Ceylon to Australia, Russia and China, less to the United Kingdom and less to America. More could have been absorbed in this country, had it been available. The increased outturn is due to intensive cultivation, not to an increase in the acreage under tea, and may be called a triumph of science and hard work over Nature, as weather conditions were not always favourable, particularly at the beginning and close of the year. The increased export to Russia consisted chiefly of dust for the Hankow "brick" trade. These "bricks," although made in China, are intended for Russia and are consumed in Siberia. The quality of the *Ceylon* crop was on the whole superior to that of last year, though a good deal of indifferently manufactured tea was turned out,

The amount of green tea manufactured continues to decrease both in India and Ceylon. This is doubtless owing to the demand for green tea being somewhat uncertain, while there is a very strong demand for black, and also to the fact that specially equipped factories are required for the former.

A Ceylon Pavilion has lately been added to the Imperial Institute, with the object of making people acquainted with the higher grades of Ceylon tea. The decorations are copied from the ruined dagobas of Anuradhapura.

Exports from *China* have again declined, Russia and the United Kingdom being the only countries which have taken more China tea this year than last. The amount which reached the Chinese ports was less than last year. Less tea reached Hankow than during any season for the past forty years. This was partly owing, no doubt, to there having been an oversupply last year and partly to the unsettled state of the interior and the uncertainty of safe transport, but Consular reports state that a great deal of the land formerly under tea has gone out of cultivation and that even in some of the best producing districts the shrub has been interplanted with other crops. There has been, however, an unusual demand for dust, so much so, that some quantity of leaf has been converted into dust. About 60,000,000 lbs. of "brick" tea were exported from Hankow, of the dust used in the manufacture of which 21,500,000 lbs. came from India, Ceylon and Java. The quality of the *China* crop was on the whole good

A large increase in the *Java* crop was expected this year, but thes anticipations were not fulfilled. The increase in exports was only 3,000,000 lbs., whereas 10,000,000 lbs, or 11,000,000 lbs. had been foretold. Weather was unfavourable and there were labour difficulties, possibly partly caused by the ravages of the plague during the last year. Between 11,000 and 12,000 persons fell victims during 1913 and in one month, April, of this year there were 1,500 fatal cases. The island is very thickly populated and the natives are extremely ignorant, so that it is exceedingly difficult for the Government to deal effectively with the disease.

The quality of this year's *Java* crop was on the whole above the average. The United Kingdom took about 500,000 lbs. more than last year, America and Canada a little more, Australia, a million less and Russia over 3,000,000 lbs. more. The greater part of the 1,800,000 lbs, sent to Singapore also probably went eventually to Russia. A good deal more tea was sold in Batavia than in previous years, Russian buyers being as active there as Calcutta and Colombo.

Sumatra has now taken her place as one of the tea-producing countries of the world and must be considered as having passed the experimental stage, Several fair sized consignments have arrived in London during the year and been sold in the open market. The tea compares favourably with the first turned out by the planters in India, Ceylon and Java. It is reported as being well made. Everything in their power is being done by the planters to produce good results; highclass Assam seed has been used, skilled managers are employed and the factories are fitted with up-to-date machinery.

Japan exported about 5,750,000 lbs, less than in 1912-13. The greater part of the exports went, as usual, to the United States and British North America, the United Kingdom taking practically none.

Rather more Oolong tea was exported from *Formosa* than in 1912 13, but the quality was not as good as in previous years. A small quantity of this tea was sent to England, packed in boxes made of wood grown in Japan. The attempts to popularise Formosan tea in this country continue, but, so far, have not met with much success. Beyond a few experts and connoisseurs the tea is unknown by name in England, although it is used for flavouring the highest class blends.

It seems strange that more tea is not grown in *Burma*, as the soil and climate are eminently suited to its cultivation, yet year after year we have to record that only a small amount is produced there, and that it is manufactured into letpet (pickled tea) and eaten as a condiment.

Tea is still grown in *Natal* and *Nyasaland*, but has not made much progress during the year.

The Russian Government continues to encourage tea-growing in *Trans-Caucasia*, where the industry is gradually developing. One writer states his opinion that in ten years' time Russia will be independent of China, as all the teas of low and medium quality will be produced in the country and it will only be necessary to import the better kinds.

A good deal of the land under tea in Trans-Caucasia belongs to the Imperial Domains of Tchakva. There are also many plantations belonging to peasant farmers and large estate belonging to the firm of Popoff, well-known tea merchants. The outturn for the year from all the gardens was about 270,000 lbs.

Tea growing in *South Carolina* continues, but does not make much progress. The experiment of cultivating tea in *Texas*, tried by the United States Government but abandoned, has now been taken up by a local syndicate.

Tea is also grown in *Uganda* and *Nigeria*, in *Siam* and the *Straits Settlements*, in *Brazil* and *Peru*, in *Mauritius* and in the *Azores*, *Andamans* and *Fiji Isles*, but in all these places the industry is still in the experimental stage or is not being actively exploited.

Turning from the question of production to that of consumption we find, as we said above, that there has been a general increase throughout the world, in spite of the rise in the wholesale price of tea.

In the United Kingdom the increase has been small, though steady, the rate per head having risen from 6·58 lb. to 6·61 lb. apparently an increase hardly worth mentioning, but making a difference during the year of more than 15,000,000 lbs.

What will be the effect of the war on the consumption of tea in this country it is impossible to say. The purchasing power of the nation will, of course, be reduced, but tea is one of the last things which English people, particularly poor people, deny themselves. There may, there probably will, be a more careful use of the fragrant leaf, as was the case when the tax was raised to 8*d.* a lb. during the Boer War, but it is not anticipated that anyone will leave off tea, or at any rate only very few. Some writers think that consumption may even increase, as our soldiers are being freely supplied with tea, in preference to other beverages.

The outbreak of the war found London unusually well supplied with tea, the stock on 1st August being 80,000,000 lbs. against 72,600,000 lbs. on 1st August, 1913. So far there has been very little interference with ships bringing tea, only between 6,000,000 and 7,000,000 lbs. having been lost in the *City of Winchester* and the *Diplomat* and a small quantity in the *Troilus*.

The following table shows the amounts contributed by the various producing countries for home consumption and also the percentage contributed by each during the last two years. The figures are taken from the Board of Trade returns from 1st October to 30th September:—

	1st October, 1913 to 30th September, 1914.		1st October, 1912 to 30th September, 1913.	
	lbs.	Pctg.	lbs.	Pctg.
India ...	180,037,701	56·47	170,415,293	56·24
Ceylon ...	94,545,940	29·65	91,319,126	30·13
China ...	13,786,911	4·32	8,777,493	2·90
Other countries (chiefly Java) ...	30,459,483	9·56	32,575,729	10·73
Total ...	318,830,040	100·000	303,087,641	100·00

It will be noticed that the consumption of British-grown tea has grown 12,800,000 lbs. and of China 4,900,000 lbs. The latter is accounted for by the high prices of Indian and Ceylon teas, which have obliged blenders to use cheap China tea for their low-priced blends.

Australasia continues to drink more tea per head than any other part of the world. Australia has taken 420,000 lbs. more Indian tea than during 1912-13; 2,613,000 lbs., more Ceylon; 1,064,700 lbs. less Java and 420,000

lbs. less China, showing that British-grown tea is increasing in popularity. The total increase in consumption is nearly 1,600,000 lbs.

So far as we have complete statistics, we find that Russia has received during the year, in round numbers, 65,000,000 lbs. of British-grown tea; 6,000,000 lbs. from Java and 24,500,000 lbs. from China, making a total of 95,500,000 lbs. A large amount of China tea is also imported into Russia in the form of Brick tea, but no figures are available as to the quantity. Since the outbreak of the war, shipments to Russia have practically ceased. But for this the imports of Indian, Ceylon and Java tea would certainly have amounted to 90,000,000 lbs., probably more, as against 82,000,000 lbs. in the year ending 30th September, 1913.

It must be remarked that although during the whole of the year under consideration Russia took more tea than during the previous year, there was a falling-off in the spring of this year, probably owing to merchants having rather overstocked in 1913. The efforts which are being made by the Russian Government to check the consumption of vodka will doubtless cause the consumption of tea to increase, but before it can do so to any extent there must be a reduction in the import duty which is 1*s.* 10½*d.* on all tea (except brick) imported over the European frontier and 1*s.* 6*d.* *via* Siberia. The Indian Tea Association and the Ceylon Association have made representations to the Foreign Office on the subject, but probably the War will prevent our Government approaching the Russian Government about the matter for the present.

The annual consumption of tea in Russia is said to be about 140,000,000 lbs. For the enormous population, this seems a small amount when compared with our own consumption. The fact is the Russian is economical in his use of the leaf and brews the same tea several times over. Were it possible to compare the quantity of liquid tea used by the two nations, we should probably find that the Russian drank more than the Englishman.

Consular reports state that the import of tea into Persia is increasing, but it is very difficult to get reliable figures. The duty is heavy, consequently there is a great deal of smuggling, the proportion of tea thus brought into the country being probably half of the total amount consumed. One Consul says that the *bulk* of the tea and coffee brought in is smuggled!

Statistics generally give exports to the United States and Canada together, which makes it difficult to gauge consumption in either properly. In both the consumption of Indian tea has increased more than of Ceylon. In nine years imports of the former have risen from 5,500,000 lbs. to 14,000,000., lbs., an increase of 155 per cent. In neither country is consumption increasing very rapidly but it is evident that British-grown tea is gradually displacing China and Japan tea. During the year less tea has been sent direct from the countries of production to North America, but more has been re-exported or transhipped from England.

There has been what might be called a storm in a teacup in Jersey. The States of Jersey decided a little while ago to give free education to the poor and in order to provide the necessary funds, in March 1913 they imposed an import duty of 4d. on tea, which had hitherto entered free. This raised great indignation and the regulation was for a time withdrawn. In January of this year, however, a duty of 2d. a pound was imposed, in spite of the remonstrances of the inhabitants. The reasons of the strong resistances of the tax is that there is a large blending factory in the island and that the fact of blending and re-export being able to be carried on free from the supervision of the Customs officials and without undergoing the usual

bonded warehouse routine gave the factory an advantage over similar establishments in London. The island had also gained a reputation for cheap tea among visitors from the Continent, who frequently continued to have tea from Jersey after their return home. The amount actually consumed in Jersey is of course small.

Tea drinking in East Africa is making rapid progress, having increased 46 per cent. during the year. Of the tea there consumed in 1913-14 over 88 per cent. came from India, over 10 per cent. from Ceylon, less than ½ per cent. from elsewhere.

Great efforts have been made for some years past by the Indian Tea Cess Committee to popularise tea in Europe. The Tea Cess, as your readers probably know, is a small voluntary tax paid by the planters and collected by the Government. The money thus raised is devoted to increasing the sale of Indian tea throughout the world. During the year under consideration, until the outbreak of the War, special efforts were being made in Germany, while all expenditure in Italy, France, Denmark and Scandinavia was discontinued. Exports to Germany certainly increased enormously, nearly 350 per cent. over the previous year, but it is uncertain whether the increase was consumed in Germany. Several of the large wholesale houses showed themselves ready to co-operate with the agents of the Fund, even contributing a share towards the cost of advertising, tea making demonstrations, etc. It seems a pity that work was not carried forward in Scandinavia, which is a very promising field, but the money at the disposal of the Committee is limited and it was thought best to concentrate on one country rather than to scatter the funds. Could they have foreseen the events of the last three months, their decision might have been different!

The use of tea in Belgium is progressing and in France "Le five o'clock" is no longer confined to a few leaders of fashion, but it is becoming usual in middle class families.

The greater part of the tea drunk in Holland naturally comes from Java. Imports of British-grown tea however increased during the year nearly 200,000 lbs., or about 10 per cent. These figures do not include the amount taken by Holland during September and October. Since the embargo on the export of tea was removed at the end of August, exports to Holland have been about double what they usually are, though enhanced prices have been demanded.

Consumption in India itself does not expand very rapidly. Some authorities think that a large proportion of the Cess funds might well be allocated to India. That a freer consumption of tea would benefit the native there cannot be a doubt, and that to serve the market at his own door instead of spending money to send his produce to other countries would be advantageous to the planter is also beyond question, but the best way of bringing the beverage and the native together seems not yet to have been found. The present annual consumption is said to be only about 1 oz. per head.

Having considered the tea-drinking and tea growing countries of the world, we see that both production and consumption have increased, being at present fairly evenly balanced. For the last three years the increased consumption has benefited planters more than distributors. We hope that next year we may be able to record increased prosperity to all concerned, in the shape of a fair return for their energy, hard work and untiring patience.

Yours faithfully,

11th November, 1914. BROOKE, BOND & CO., LTD.

—*The Indian Planters' Gazette and Sporting News.*

RUBBER

Rubber Export Prohibition.

In view of the extraordinary position of the raw rubber market and the interpretation placed upon the war regulations issued by the British Government, it is necessary to enter into some explanation.

In the *India Rubber Journal*, issue dated October 3rd, we stated that our own Government had prohibited the export of raw rubber from Eastern ports to anywhere but England and the countries of her Allies. This meant, we added, that New York supplies must come through London.

In our issue of October 24th, Colombo cabled London confirming our statement. This, however, was probably because Colombo had then received the *India Rubber Journal* dated October 3rd.

Last week the British Board of Trade published an official notification from the Colonial Office that telegraphic instructions had been sent to all British Governments oversea to prohibit the exportation of rubber except to British ports.

Now the British Government has issued a further instruction to the effect that rubber cannot be shipped from the United Kingdom to any port.

These decisions were contemplated by all whose duty it is to keep in close touch with the raw rubber market.

Stringent Regulations Necessary.

It may be difficult for the ordinary man in this country to see the necessity of the regulations issued by the British Government. We think, however, that these notes show that action of a drastic nature was necessary.

In October, we received from our New York agents advice that a certain steamer (which was named) had been cleared for Copenhagen with 134,117 pounds (299 cases) of rubber, valued at $62,000. We were also advised that another steamer had been cleared for the same port with 211 bags and 263 cases of crude rubber.

At a later date, we were informed that inquiries were received from Sweden for appreciable quantities of crude rubber. A load of pale or brown crepe, to be shipped per Scandinavian-American Line steamer, and consigned to Gothenberg, Sweden, was traced by our agents. Payment was required before shipment, and the consignee was "to be a native of Sweden;" the names of the principals were not to appear. We then completed arrangements for cable advices whereby we could be kept informed of developments.

At a still later date, we were advised, by the same agents, of consignments to Naples and Bergen, Norway. There was great activity in New York in the later part of October, and various shipments were reported to us as being planned for early execution. It was also stated that all shipments, from New York in neutral bottoms to neutral ports, were paid for in full before landing aboard steamer.

At a still later date, the Press announced that the Secretary of the United States Treasury had issued an order prohibiting the disclosure of

information concerning export shipments from the United States until thirty days after a vessel had cleared from the port.

We could not, for obvious reasons, publish the information we possessed, and contented ourselves with communicating it to the proper quarters. This action was taken by us because we were told, rightly or wrongly, by our informants that the crude rubber was intended for German consumption.

Plan of Action.

The Government of this country would not be doing its duty if, believing that raw rubber (already declared contraband) was being sent from New York for Germany through neutral ports, it did not take immediate steps to, as far as possible, check the supply to the enemy. The first obvious step was to prohibit the export of raw rubber from the East to any port other than British. Once all supplies of plantation rubber were consigned to London it was easy for this country to declare that it should not be re-exported to any country for ultimate conveyance to the enemy.

Courses open to Users.

It is still for New York to get its supplies of raw rubber from Brazil or to secure what it requires of plantation grades by guaranteeing that it will be used for home consumption and not re-exported. It is common sense and quite reasonable business. We are aware of the advices sent during the last few weeks to American firms, and it remains with the latter to enter into the necessary guarantees if they want plantation rubber. If neutral countries will prohibit the re-export of crude rubber the whole difficulty will be solved.

C. I. F. Contracts.

Considerable difficulties will be experienced, especially by those British plantation companies who have sold forward, c. i. f. New York, with the intention of shipping from Colombo or Singapore direct. These plantation companies have had to get their rubber to London, and the expense of war risk and extra freight materially reduce their net receipts. In fact, it is doubtful whether the contracts can now be fulfilled. Other companies who have sold forward, ex warehouse in London, and whose brokers have guaranteed the solvency of the buyers, should be able to deliver their rubber and receipt prompt payments.

Further Legislation Possible.

We imagine that the Government will realise the importance of plantation rubber to the British, and that subsequent legislation will be passed which will enable them to achieve their object more effectively. We think that the grant of licenses to exporters to neutral countries, unrestricted exports to Allies, and the protection of the trade financially will call for some consideration. Japan, France, and Russia want rubber. Licenses to export wool and woollen goods are now being granted by the Board of Trade when the goods are destined for British territory or Allied countries. Where licenses are being granted for the export of wool, they are being issued through the Privy Council Office on the recommendation of the "Trading with the Enemy Committee." We understand that the Committee mentioned is largely guided by the War Office. This can easily be done with rubber.

Immediate Effects of Prohibition.

It is quite clear that the immediate effects of the prohibition will be an accumulation of plantation rubber in the United Kingdom, a demand for

wild rubber from Brazil and Africa on account of America, and lastly it may result in some concerted action among producers to limit tapping or actual sales below fixed prices. A serious fall in the price of rubber would render it unprofitable to collect. This apart from the terrible effect on the labour situation in the East, would eliminate the large sum in the form of income tax paid on the profits of so many companies registered in this country. Already there has been a serious fall in the price of plantation and an increase in that of Brazilian rubber.

It is clear that, while every shareholder will loyally abide by any decision of the Government to prevent the enemy securing any produce which may help to sustain him while at war, others will feel that the action is in itself ineffective. In our opinion the effective way of stopping shipments of rubber to the enemy is by examining all cargoes in neutral bottoms until the United States prohibit the re-exportation of crude rubber. This, coupled with the issue of licenses to approved exporters dealing with neutral territories should be effective. Under the present arrangement neutral territories can well buy all the rubber they want to ship to the enemy from Brazil and Africa. It is conceivable that, if the prohibition was operative for a sufficiently long period, it would lead to the ruin of the plantation industry and to the salvation of Brazil. At the present time plantation rubber only slightly exceeds in output the totals from Brazil and Africa, supplies from the latter areas having only recently been replaced by the former product. We think, we have indicated that the mere prohibition of raw rubber exports from this country will not achieve the object in view. There is no reason to believe that action in this country will be allowed to threaten the plantation industry in which the British Empire holds first place.

Labour on Rubber Estates.

Such a prospect would have a disastrous effect on our colonies. It may not be known to every investor in this country that plantations in the Middle East employ millions of coolies who have no means of gaining a livelihood other than by working on estates. If we compute the planted Hevea area in the Middle East at one and a quarter million acres, and allow that one coolie is required for every two acres, it is at once apparent that the maintenance of such a large and necessary force in a state of contentment is absolutely essential. Any interference with the means of sustenance, such as non-employment for a fixed term, or even only two days' work per week, would result in nothing short of riot. The Tamils in Ceylon and Malaya, the Chinese and Javanese in Malaya and Sumatra, and the natives of Ceylon, Malaya, South India, Sumatra and Java number millions.

These diverse forces must be kept employed and in a contented state. Should the producers elect to curtail or entirely stop tapping operations, labour would have to be discharged wholesale. The full effect of such action we need not contemplate; it is so obvious that we feel sure the British Government must have considered it.

It is imperative that the investors in this country, holding as they do the major portion of the world's plantation interests, should give their whole-hearted support to all steps taken by this Government to cut off essential supplies of commodities to the enemy, even though it may cause serious temporary embarrassment to many. We may rely on the authorities carrying out their programme with the minimum inconvenience or loss to all who do not wish to aid the enemy.—*The India Rubber Journal.*

The Planters' Chronicle.

RECOGNISED AS THE OFFICIAL ORGAN OF THE U. P. A. S. I., INCORPORATED.

(Secretary's Registered Telegraphic Address "Planting," Bangalore.)

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THE U. P. A. S. I.

(INCORPORATED.)

Contents

This issue almost synchronises with that time of year that all civilised nations associate with "mirth and jollity," and we would fain wish our readers a Merry Christmas and a Happy and Prosperous New Year, but under the circumstances, when nearly every household almost hears "the rustle of the wings of the Angel of Death," it seems a mockery to wish one and all a Merry Christmas. Rather let us look forward to 1915 and hope that it will bring peace and prosperity to all; and that that Peace will be restored consistent with the object with which England entered into War. On no other terms would Peace be acceptable, and until that object is attained the war must and will be prosecuted.

The Scientific Department supplies us with an article on "Coffee Digging," which is the outcome of an enquiry of a correspondent. Though no hard and fast rule is laid down, it is we think the experience of old planters that deep digging should take place in young clearings.

We publish the proceedings of a General Meeting of the North Mysore Planters' Association. As regards the para. dealing with the U. P. A. S. I. Labour Department we are sure that the N. M. P. A. will not have to *fight* for their rights. The Director is convinced of the importance and interests of Mysore and Coorg and has secured a first rate assistant in Mr. Lescher to protect them.

We would call attention to the Post and Telegraph Department Orders on page 775.

On the following page we give an interesting address on "Manuring" read by Mr. R. S. Cunliffe before the Couva District Agricultural Society. Starting with the history of manuring it goes on to Field Experiments and we shall continue the address in our next number.

We are indebted to the *India Rubber Journal* for an article on on "Tapping" by Mr. N. C. S. Bosanquet and we publish a very interesting table.

At the request of the Director of the Labour Department, we publish a judgment by Mr. Crossman in a case in Ceylon that appeared in the *Times of Ceylon*. We do so without any intention of making any comments on it.

SCIENTIFIC DEPARTMENT, U. P. A. S. I.

Digging Coffee.

Some years ago when touring and lecturing in Mysore and Coorg I expressed some rather decided views about the practice of deep digging in established coffee. A correspondent now wishes to know whether I have altered the views then expressed. I have not materially done so, in fact the experience I have gained since then has strengthened my opinion as to the harm done by digging and cutting of the surface feeding roots in old coffee, and by digging I mean *deep* digging, of eighteen inches or more with a fork or mamotty.

In my opinion all the digging necessary to get a good tilth should be done in the young clearings. Whenever possible after felling and clearing the land, all the stumps of the jungle trees should be dug and jacked out and the whole clearing forked two feet deep taking out and burning as many roots as possible. Though the initial expense is large, I am convinced that this is an economical method in the long run, as trees will not afterwards be lost by root diseases, a constant source of trouble which few estates escape, and the young shade and young coffee will grow more quickly. In each succeeding year the soil should be forked between the rows of Coffee in strips as wide as possible without disturbing any of its roots. Each year, the strip which can be safely forked without cutting Coffee roots will become narrower and narrower until the Coffee closes in and no digging can be done without breaking and exposing its roots. At this stage it should cease altogether. By this time the shade trees will be giving a mulch of dead leaves and if a green dressing crop has been used in the young clearing, as it should, the combined mulch will keep the soil tilth obtained and the soil will be in such good mechanical condition that it will need nothing but shallow surface cultivation an inch or two deep at the most for very many years, and this surface cultivation may be given when manures are applied. Fully established coffee should not be dug deeply at all if it can possibly be avoided and if it is established in the right way it will not need digging for a long period.

No absolutely hard and fast rules can be laid down for Coffee cultivation, however, and to the above general principle there are naturally exceptions. In some cases the soil becomes hard and puddled, a state of things usually caused by wrong methods of cultivation and manuring, and in such a case deep digging may have to be resorted to in order to restore the tilth. This should be looked upon as a curative method however and not as a permanent process to be carried out year after year. Again in very old estates when the shade has grown big the soil may become so full of shade tree roots that the Coffee suffers. In this case again it may be necessary to adopt deep digging occasionally to cut the shade tree roots. These are, however, special cases and it should be remembered in this connection that a Coffee estate will not last for ever. In many instances I know in South India, the coffee is dying from old age as much as anything else and the time has come when it should be renovated by collar pruning.

The case for shallow cultivation is, however, quite a different one. In many districts this is a necessity especially where a good mulch of leaves is not established or where the soil has a natural tendency to cake and crack in the dry weather. As pointed out some time ago (*P. C.*, Vol. VII p. 620) certain types of soil to be found in Coorg will benefit from a light dig in the dry weather, in fact, where this advice was adopted, I have received reports

that it has been beneficial. It is often of advantage too to lightly work manures, especially artificials, into the top two inches of soil, but this is not what is meant by digging in the ordinary sense, in which it is used in Coffee districts.

That the soil gets into a bad condition necessitating digging it over and over again is due to wrong treatment in the past, and more often than not to a wrong system, or what is even worse, no system at all of proper manuring when the manures applied are adapted to the particular necessities of the soil and applied so as to supplement one another, and sometimes due again to the fact that the soil has never been limed for years. If Coffee is started right at the beginning and then properly manured and attention paid to the establishment and preservation of a mulch, it will be found that deep digging is not only not necessary but harmful and it should be avoided as long as possible. Under these conditions when it does become necessary, it is usually time to renovate the clearings altogether.

Production of Tea in India

The Report on the Production of Tea in India during 1913 issued by the Department of Statistics has just come to hand, and the following figures are extracted from it.

The total area under tea in the whole of India was 509,700 acres, nearly 3 per cent. more than in the preceeding year. Of this area 26,278 acres are situated in the Madras Presidency and 37,430 acres in Travancore and Cochin; a total of 63,718 acres for Southern India or 10·45 per cent. of the whole area. In this part of India the cultivation of tea is rapidly spreading, the percentage increase during the year being 8. 8.

The total production of Tea during 1913 was 307,097,000 lbs, of which Southern India contributed 22,245,000 lbs or 7·2 per cent.

The average production per acre naturally differs very much in different districts, depending largely upon rainfall, and elevation. The following average figures are quoted for Southern Indian districts

Travancore	...	... 514 lbs per acre
Malabar	...	... 483 „ „ „
Nilgiris	...	... 393 „ „ „

During 1913-14, 289,519 thousands of pounds of Tea were exported from India by Sea and 2,196 thousands of pounds by land, 72 per cent of these shipments being to the United Kingdom. It is of interest to note under existing conditions that the export to Germany during the period under review increased by 55,000 lbs. and to Austria by 34,000 lbs.

The amount of Tea consumed in India is arrived at by deducting the imports from the net exports but this is not accurate. The figure thus obtained is 22,797 thousands of pounds.

The number of persons employed in the Tea industry in the Madras Presidency is 15995 permanently employed and 3,988 temporarily employed and in Travancore 28,565 permanent and 6,175 temporary. In Southern India however the work is sometimes done by contract and in this case no record of the labour employed is available.

RUDOLPH D. ANSTEAD,
Planting Expert.

DISTRICT PLANTERS' ASSOCIATIONS

North Mysore Planters' Association

Proceedings of the General Meeting held at Balehonnur on the 7th December, 1914.

PRESENT.—Mr. A. F. Evetts (Chairman), Messrs. C. H. Browne, C. P. Reed, F. W. Hight, E. H. Young, and C. C. Kent (Honorary Secretary). *By Proxy*:—Messrs. F. J. Parton, R. G. Foster, C. S. Crawford and S. L. Mathias. *Visitor*:—Mr. G. V. R. Friend.

The Minutes of the previous meeting were read and confirmed.

Change of Rules.—The following proposal was made from the Chair and seconded by Mr. C. C. Kent: "That the old system of Quarterly General Meetings, without a committee, as working better and giving more satisfaction to members of the Association, be again reverted to." It was pointed out that it was usually impossible to obtain a committee to meet together from all parts of the districts, and that it is impracticable to do the business that crops up, through the post, and also that members are not kept in touch with what the Association is doing. The proposal on being put to the vote was carried by 165 votes for, and 27 against.

Arrears of Subscriptions.—Read letters from defaulting members, and the meeting noted with satisfaction that they all promised to pay with the exception of one member who had not yet replied.

U. P. A. S. I. Labour Department.—The following letter to the Honorary Secretary from a member of the Association was read to the meeting: "I understand from figures you gave me that Mysore and Coorg pay over one-third of the income of the Labour Department: such being the case, as nearly all the labour for these districts, together with much for Wynaad and Malabar come from S. Canara, the staff of the Department in Mangalore should be on the same scale or bigger than any other of the recruiting stations. I think our representative, Mr. Browne, should have all the support it is possible for us to give him in fighting for our rights, and I will gladly support any resolution that may be made to this effect. The Executive of the Labour Department has not given subscribers particulars of the allotments made to the various districts, and I think it should do so at once. The fears expressed by many that the Department would favour the big concerns in the South would be allayed, and the movement would gain in popularity were it widely known that the income was being fairly devoted to the interests of the Associations who supply the largest share of the funds." Mr. Browne, on behalf of the Committee of the Labour Department, replied that there was no doubt that the importance of Coorg and Mysore was now being realised, and that a first class agency adequate to cope with these districts would be maintained in South Canara with a competent man in charge.

Gift of Coffee to the Troops.—Read letter from the Secretary U. P. A. S. I., *re* gifts in kind to the troops. It was decided that the Honorary Secretary approach the Secretary of the U. P. A. as to collection and preparation of any coffee likely to be given in a private capacity and that members should be notified.

Roads and Contract rates.—Read letter from the Superintending Engineer, and Executive Engineer, and it was noted that the question of enhancing rates of road works was under consideration.

Assistant Scientific Officer's Programme.—Read letter from the Honorary Secretary South Mysore Planters' Association. Resolved "That the Honorary Secretary do write to the Honorary Secretaries of the South Mysore Planters' Association and the Bababudin Planters' Association, that in the opinion of this Association a member from each of the three Associations should be elected annually to form a board of control for the Assistant Scientific Officer and that under these circumstances it seems doubtful whether it is necessary to continue the Council of Mysore Planters' Associations as it now stands."

Commission and Feeding charges on Government Cattle Pounds.—Resolved "That the Honorary Secretary be requested to write to the Deputy Commissioner pointing out to him the difficulties experienced in recovering from the Treasury the refund of Feeding charges and commission on fines on Government Cattle Pounds situated on private Estates. In one case no refund or feeding charges have been received from the Taluq Treasury since 1909 notwithstanding numerous and repeated applications which are ignored by the Taluq officials.

H. R. H. The Prince of Wales' National Relief Fund.—The sum of Rs. 795 has been collected by the Hon. Secretary and the equivalent in sterling remitted to London.

(Signed) A. F. EVETTS,
Chairman.
(„) C. C. KENT,
Honorary Secretary.

POST AND TELEGRAPH DEPARTMENT ORDERS.

Copy of a letter No. 560s-Es. dated the 6th October, 1914 from the Director-General of Posts and Telegraphs to all Postmasters-General.

With reference to this office letter No. 216s-Es. dated the 19th May, 1910, regarding contributions from the public against loss on account of experimental post offices, I have the honour to say that the Director-General has decided that the following general principles on subject should be observed in future :—

(1) If an office is likely to prove self-supporting under rules 559 and 560, Volume III, Post Office Manual, no contribution should be taken, even though offered.

(2) If an office is not likely to prove self-supporting, it should ordinarily not be opened or continued, whether the public be willing to contribute or not. In special cases, however, such as an office required by a contractor or other private person temporarily for a particular purpose, the Postmaster-General may, if the office is not likely to pay its way, exercise his discretion as to accepting a non-returnable contribution, made unconditionally. The contributions in such cases should represent such portion of the actual establishment charges of the office (including the separate line, if any, required to serve it), as the Postmaster-General may consider it necessary to recover for the purpose of safe-guarding the Department against loss.

(3) Offices declared by Local Government and Administrations to be necessary on administrative or political grounds should be opened and maintained irrespective of the question whether they are likely to prove self-supporting, and no demand towards their cost should be made in any case.

MANURING.

(Society Paper No. 604.)

Some Problems in Manuring.

By R. S. Cunliffe, B.Sc., (Edin.) F. R. A. S. E., etc.

Read before the Kouva District Agricultural Society, on 19th August, 1914.

History of Manuring.

Manuring in one form or another is probably as old as Agriculture itself, and that is as old as the human race; at least that part of it of which we have any historic record. Many of its principles were known to such ancient nations as the Greeks and Romans, and before them to the Egyptians and Chinese, the latter of which have been and still are past masters in the art of the conservation of soil fertility. Nor was the knowledge of the ancients all merely blind tradition. The Greek philosopher Aristotle advanced a soil theory as early as 300 years before the Christian era, which was not seriously disputed until about 400 years ago when von Helmont advanced his water theory—that plants derived all the substances necessary for their growth from water. The discovery of oxygen by Priestly led to the knowledge of the role played by the carbon dioxide of the atmosphere in plant life. On top of this came the humus theory in its various forms, by which it was laid down that plants lived, grew and carried on their life functions by the aid of organic materials, and water, through what was called "vital power"—not very different after all from views held to-day. Then came the demonstration by Lawes and Gilbert of the power of certain plants to utilise the nitrogen of the air, while others could not; but it remained for Liebig to bring anything like order out of all this chaos, by the publication of his "Plant-food," theory, and which has remained practically unassailed for half a century, until the modern development in our own day of the sciences of bacteriology, soil physics and plant physiology have shown us how complex and wonderful is the life of even the simplest of plants. Is it astonishing then that the question of "how plants feed" should have been, and is now, one of absorbingly practical interest; and one which most of the best thought in the past and present, has been and is, engaged in trying to solve? It is worthy of note that the earliest Agricultural Experiment Stations were founded for this object, and were occupied almost entirely on the subject of manuring, and such is still largely the case; though owing to our increased knowledge the subject is now approachable from many different standpoints. This brings us to the question of plantfood.

Plantfood.

Manuring is the addition of some substance or substances to the soil with the object of maintaining its fertility or power to produce crops. In other words, in maintaining the plantfood supply of the soil, by replacing that carried away in crops or lost in the drainage water and in other ways. Owing to the rapid advances made in several branches of science in recent years, and the flood of light that such has cast on the relation existing between the soil and plant; many of our old ideas are passing through a transition, which has given rise to several opposing theories on the question of plantfood. The views put forward by Justus von Liebig over half a century ago have been the basis of the science of manuring ever since, and there is still no reason to doubt that such are correct, though modified somewhat by increased knowledge, supplied by developments in bacteriology and physiology. Even Liebig himself was aware that chemical analysis of

the soil and the plant was not always a safe guide to the manurial requirements of each, and since his day we have learned much of why such is so.

Opposed to the "Plantfood" theory are several views of recent origin, but we have only time to mention one here, namely, the "soil solution" theory of Cameron and other scientists, of the United States Department of Agriculture. Briefly, this consists in the assertion that soil fertility depends on the strength or concentration of the water solution of plantfood elements in the soil, irrespective of the total quantity present. Doubtless the truth lies between these two views, but more study and investigation is necessary before they can be harmonised. Meanwhile, practical experience teaches us that the addition of certain things to the land increase our crops if the other conditions of plant growth are in harmony. The latter is a point frequently disregarded by most amateur and some professional experimenters. Before we can expect any crop to respond to manurial treatment the other conditions of plant growth must be present in due proportions. There must be sufficient moisture in the soil, the soil must be in a proper physical condition for normal root development, which implies efficient cultivation or mulching, there must be a due supply of air and light, an absence of injurious insects or disease, and the right material must be applied at the right time, and in the right way. Unless these conditions are fulfilled, no results can be obtained. This brings us to the question of soil fertility.

Soil Fertility.

Soil fertility, as we have seen, consists on the ability of the soil to produce crops, and its power to do so is measured by its power to maintain the supply of plant-food in a form, and at the time, suitable to the requirements of the crop to be grown. How to measure the amount of available plant-food in a soil has always been a question surrounded by considerable difficulty. The earlier observers, being mostly chemists, attacked the problem from a purely chemical point of view, and attempted to solve it by soil analysis, but this was soon proved to be unsatisfactory, as results in practice did not correspond to those obtained in the laboratory. This in part gave rise to De Ville's theory of testing the ability of a soil to produce crops by the evidence of the plant themselves, and is that largely followed to-day. It must not be inferred from this that soil analysis is valueless, but rather we have learned, through a fuller knowledge of the conditions, to relegate such to its proper place. As Dr. Samuel Johnson, First Director of the Connecticut Experiment Station, once said "Soil analysis is always interesting, often valuable and rarely economical."

As an instance of the unreliability of soil analysis alone, as a guide to the manurial requirements of any soil, nearly all of the red and black soils in the island of Cuba show a high percentage of Phosphoric acid when subjected to laboratory tests, yet in practice there is no element of plantfood more needed, and the addition of which in any of the usual forms will produce such results, even when used alone. Similarly, certain soils, notably in Hawaii, are known to analyse high in nitrogen yet they respond to nitrogenous manuring; and there are many clay soils in Trinidad and elsewhere that will respond handsomely to potash manuring if properly applied. This does not mean that science or theory is incompatible with practice, or that the latter can ever reach its true development unguided by carefully directed research. Mere practice is deficient in all that belongs to the province of science to suggest, and science alone lacks that which practice is naturally fitted to supply, each is the complement of the other, and rational agriculture is the result of their union. This brings us to the question of field experiments.

Field Experiments.

These may be divided into two classes, namely, haphazard experiments which often reveal new facts, but are seldom of real value to the man who makes them, because he does not reason, and therefore fails to grasp their significance. The true scientist experiments with a definite object of proving or disproving certain facts or theories. In his case, a negative result is often as valuable as a positive one, but in practice we have no use for negatives. In endeavouring to increase the productiveness of the soil there are two stages to be considered, first, the correcting of some chemical or physical condition, and secondly the maintenance of normal conditions after they have once been established. Needless to say, both are to be aimed at. In conducting field experiments two systems are mainly used to this end :—

(1) A certain yield per acre is assumed and sufficient plantfood is added to produce this. Having of course, due regard to the moisture holding capabilities of the soil or other limiting factors that may be present.

(2) An arbitrary formula is chosen as a starting point and plots laid out with different amounts, and omitting or doubling each element in turn.

The simplest form in which such an experiment can be planned consists of five plots. One of which receives a complete mixture of the formula determined upon, one receives no manure, and the remaining three the same as plot No. I, but with one of the three elements of plantfood, nitrogen, phosphoric acid and potash missing in each. By this means, if careful records are kept, and no disturbing factor enters to upset results it is possible to form a fairly reliable idea of what the particular soil requires. But in all experiments, there are other conditions to be considered besides the mere application of a certain amount of manure, of a certain formula. Among such are the kinds of materials to be used, the avoidance of indirect effects, the right method of application, the question of the most profitable amount to apply, and a rational interpretation of the results obtained. The indirect effect for instance of such substances as sulphate of ammonia or basic slag may very materially interfere with the character of the results and this applies to other materials also. The use of the right material and the methods of its application may mean the difference between success and failure. If a slow acting manure is applied to a quick-growing crop in a dry locality, failure to get results, experimental or economical will inevitably be the result, and the same implies, in part at least, to a crop like sugar-cane if manures are applied on the surface of the ground when the crop is half grown. Only under the most favourable soil and weather conditions need beneficial results be expected. The same reasoning applies to the application of lime, pen manure and mulch ; all excellent materials if properly used, at the right time and in the right place, but frequently sadly misapplied. Of no less importance is the determination of the most profitable amount to apply. This is best ascertained by carefully planned experiments in each case, as local conditions of soil, climate, cost of materials and value of the produce have very much to do with the question. Last, but by no means least, is the rational interpretation of results. No matter what these may be, whether successful, or even an apparent failure, unless we are careful very erroneous deductions may be drawn.—*Proceedings of the Agricultural Society of Trinidad and Tobago.*

(*To be continued*).

TAPPING.

The Tapping Interval.

By N. C. S. Bosanquet.

This subject has been so often discussed, and the experiments made in connection with it have differed so largely, that I feel the results of experiments over rather more than a year may be of interest. Personally, I have no hesitation in saying that the alternate day system of tapping gives the best results in every way :—

(1) As regards yield.
(2) As regards cost price.
(3) Economizing bark removal.
(4) Lessening the number of tappers required.

In making experiments planters are apt to overlook the fact that a few months' alternation in a tapping system does not constitute a fair experiment, and I have constantly heard the remark, "Oh, we tried the alternate-day for three months, but the results were so appalling that we knocked it off." Obviously they would be appalling for the first few months, the trees having been made accustomed to every-day tapping take some time before yielding to the alternate-day, but at the same time an immediate result of alternate day tapping showed 5·77 grams, while in the corresponding month of the following year the yield per tree was 7·60 grams. That is to say, in January, 1913, 3,992 lb. were produced at a cost of 1,357 guilders on every-day tapping, the following January showed 6,045 lb. costing 1,069 guilders, and three months later, 8,892 lb. at a cost of 1,126 guilders. The above "costs" represent in each case tapping and manufacture only, and the yields and costs per pound work out as follows:—

(1). Every-day tapping.—3,992 lb. at 34 cents per lb. from 16,142 trees = at the rate of 2·33 lb. per tree per annum.

(2). Alternate day.—6,045 lb. at 17·7 cents per lb. from 25,448 trees = 2·84 lb. per tree per annum.

(3). Alternate day.—8,892 lb. at 12·4 cents per lb. from 27,481 trees = 3·87 lb. per tree per annum.

It must further be noticed that in the alternate-day tapping new and younger trees to the number of 9,306, and then a further 2,033 are included in the figures shown. As regards costs, there can, I think, be no question as to the cheaper method—alternate-day tapping can be calculated to rather more than halve the cost of tapping, while less assistants are needed on the estate, and a considerable saving is made in tools. On an estate in full bearing the decrease in the cost of line room required, and consequent upkeep of lines is also considerable.

With regard to bark saving. On an experiment carried out over one year, the bark on alternate-day tapping lasted just about five months longer than on every day. The contention that the bark dries back on the cut in consequence of a longer tapping interval is certainly true, and alternate-day tapping does not show half the bark used as against every-day tapping, but in every case I have found an enormous saving in bark removal.

Finally, as regards labour an estate of 1,000 acres with coolies tapping 300 trees and planted 100 trees per acre will require 330 tappers, and in these days of labour difficulties the reduction to 165 tappers is more than worthy of attention. I am encouraged to touch on the tapping interval, as I think I am correct in saying that daily tapping is practically universal in Java, while I know that many properties in the Straits still practise it. The following yield and cost price figures as a comparison between the two systems may be of interest ;—

	Tappers.	Crop.	Yield per tree grams.	Cost per lb. cents.	Rainfall mm.	Rain days.	Trees tapped per day.	Total trees tapped for the month.	System.
October ...	1,243	1,841	2·32	29	338	11	11,903	357,090	Every day tapping.
November ...	1,064	2,275	3	20	338	17	11,375	340,270	
December ...	1,000	1,676	3·03	19	332	16	8,297	248,910	Showing the last 3 months of one year's tapping on every day system.
January ...	590	1,608	4·54	13	384	18	5,312	159,380	
February ...	373	1,342	4·75	14	478	20	4,237	127,130	
March ...	650	1,594	3·95	13	375	18	6,053	181,590	
April ...	566	1,625	4·78	13	340	12	5,099	152,981	Alternate day begun in January.
May ...	619	2,212	6·50	12	331	11	5,105	153,154	
June ...	602	2,515	6·75	11	214	7	5,588	167,660	

In February there were 11 days with no tapping owing to rain, and in December and March 10 days in each month. The results show that in the sixth month of the alternate-day tapping a larger crop was secured than in the best month of the every-day tapping. June and December the yield per tree more than doubled, and the cost per pound nearly halved. Taking months with an equivalent rainfall, October and May both had 11 days' rain with 338 and 331 mm. respectively; the results are practically the same as in June and December. The above figures are taken from a 94 acre clearing of seven-year-old rubber.—*The India Rubber Journal.*

JUSTICE IN SABARAGAMUWA.

A Judgment of Mr. Crossman's.

We give below the judgment of Mr. A. L. Crossman, Police Magistrate of Ratnapura, in a case in which about 70 to 80 coolies of Pinkande Estate, Ratnapura, were charged by their employer, the Superintendent, with quitting service on the 25th ultimo. Mr. Crossman was engaged for two days in making a full inquiry into the matter. Mr. R. N. Asirwatham, Proctor, appeared for all the accused. We have not the full proceedings before us which would have given the prosecutor's version. Mr. Crossman appears to have made the most of the condition of the coolies and the Assistant Medical Officer's opinions. The attitude of the Ceylon Planter to his labour force on whose well-being he depends for the profits of the estate is well-known and it is hardly necessary for Mr. Crossman to have emphasised a Superintendent's duty towards his labour force. The planting community with their experience of the condition of some of the coolies coming from the coast ("coast" in Ceylon means any part of India. *Editor Planters' Chronicle*) and of their habits will be in a position to take their own view of some of the very much repeated statements in the judgment. The comments on the half-pay system throws some light on the Magistrate's decision. We are not told why he is unable to accept Mr. Berry's statement that no complaint had been made to him.

THE JUDGMENT.

"It was agreed of consent that of some 60 or 70 odd cases put in against this gang—evidence should be recorded in 8 cases in all. . . . It was agreed that the other cases stand or fall by the result of these cases, and I shall write a full judgment in this case P. C. 28,192, and the reasons given here will apply to all the other cases, they being members of the same gang on the same estate. I acquit the accused in this case and in all the other connected cases. My judgment must necessarily be of some length and I reserve same for to-morrow.

Accused acquitted.

A. L. CROSSMAN, P. M.

In continuation of the above remarks of the cases which were agreed or to be tried and mentioned above, I have called for the defence in this case only. In the great majority of these cases, it would be impossible to call the accused, as they do not know sufficient Tamil, their native language being another South Indian language of which I have no interpreter. I think the cases can be quite well decided on the prosecution evidence.

The first point which I would emphasise is the scandalous neglect with which the sick coolies, who form about one-third of the number charged, have been treated.

It is an employer's duty to see that his coolies are properly treated during illness and sent to hospital, if necessary. I consider that complainant in these cases has entirely failed to fulfil his duty. The coolies, who are still in health, can see the way in which the other members of this gang are neglected in illness and the pitiable state to which they become reduced. I consider this a sufficient cause for quitting service. I will refer in particular to P. C. 28,192, in which this complainant has charged one Peria Nagappa. When this man was brought to Court this morning (27th) he was too ill to stand and was a pitiable sight. I had him examined by the Assistant D. M. O., Dr. Nair, who states that he has multiple ulcers in both

legs, eczema, anaemia and general weakness and that he is unfit to walk. The D. M. O. considers that he must have been in this condition for a fortnight and that the case is too bad for an estate dispenser to treat and that the man should have been sent to the hospital. Let us see how he has been treated on the estate. The complainant, Mr. Berry, actually states that he thinks the accused Peria Nagappa is "humbugging." If in so bad a case as that, the Superintendent, Mr. Berry, considers that the man is humbugging, *i.e*,, feigning illness, it is quite clear that his coolies are being shamefully neglected and that he does not take the trouble to ascertain whether they are ill or not.

Let us go a little further and look at the evidence of the estate dispenser Daniel. He states that Peria Nagappa got no sick rice, since 16th instant and that he has worked since then.

The D. M. O. states that this man Peria Nagappa must have been in his present state for about a fortnight. It follows then, that a cooly in that condition has been left on the estate without sick rice or any proper treatment for the last ten days. The Superintendent had not thought it necessary to send him to hospital, bad though his condition is. It is not surprising that the other members of the gang, seeing the serious neglect with which their sick companions are treated on Pikande Estate and knowing that it may be the turn of any one of them next, have quitted the estate "en masse." I consider they are justified. To remain on the estate under its present Superintendent, Mr. Berry, would be a serious risk to their lives. It is an important duty of a Superintendent to send his coolies to hospital for skilled treatment if their illness requires it. It is clear that in Peria Nagappa's case and in those of Kistna (P. C. 28,125) and Nagappa (P. C. 28,174) the dispenser's treatment has had no result. In Kistna's case the D. M. O. states that he has a large unhealthy ulcer on the ankle and that he is unfit to work, also that the ulcer shows no signs of healing, and that the case would be better treated in hospital. He gives practically the same evidence with regard to Nagappa. All these cases should have gone to hospital. Yet, the Superintendent has not sent them. In fact in the very worst case, as I mentioned above, Mr. Berry (complainant), believes the man to be merely malingering. He has left these bad cases to the care of a mere dispenser, who on his own admission, has done no more than pass the preliminary examination of the Medical Department and who further admits that he was short of medicines in October (this month), *e.g.*, bandages, indispensable to proper treatment of ulcers. I regard it as clear that Mr. Berry has failed to fulfil his duty in giving his coolies proper treatment when ill. Mr. Berry states that no complaints were made to him. I regret that I am unable to accept Mr. Berry's evidence on this point.

It is improbable in the highest degree that these neglected coolies who have plenty to state when they come to Court should have allowed themselves to sink into this present bad condition without making any complaint to the Superintendent. If one may judge from his attitude in Peria Nagappa's case, Mr. Berry would be likely to ignore complaints of sickness.

If he regard Peria Nagappa as merely shamming illness, one may well ask what sort of attention and hearing he is likely to give to ordinary complaints.

I consider that the cases of Peria Nagappa and Kistna show that the complainant habitually neglects sickness among his coolies and that he fails to send to hospital even bad cases which should be sent there. I invite attention to letter A. filed in P. C. 28,192 in which Daniel the Dispenser writes

to one John, apparently another Dispenser, asking for loan of medicines on October 20th.

A reference to the letter will show that the Dispenser had not a proper supply of requisite medicine. It is admitted that diarrhoea is very prevalent on this estate, yet, the proper drugs for treating it are not available. Mr. Berry has stated in his evidence in P. C. 28,192 that he is not aware of any shortage of medicine in October.

Either Mr. Berry is stating what is not true or this is an example of his carelessness and lack of supervision. In any case, none but mere trivial cases of sickness should be treated by a common dispenser, who has no skilled medical knowledge. In this connection please see Dr. Nair's evidence in P. C. 28,174 in which he says that Nagappa's ulcers are of long standing and ought to have been cured. In Kistna's case (P. C. 28,125) the Dispenser Daniel states that he did not find Kistna to be ill until 24th instant *i.e.*, two days before he appeared in Court with a large ulcer about three weeks old, unfit to work and hardly able to walk.

During these three weeks Kistna has apparently received no sick rice or treatment. No notice was taken of his illness. I refer to the Planters' Legal Manual p. 53 :—" It is the master's duty (on estates) to inform himself of all cases of sickness on the estate and to take such steps as he may deem best for the immediate relief of the sick and so send to the Hospital any labourer requiring treatment." How far Mr. Berry has neglected these duties is apparent from the evidence in test cases P. C. 28,174, 28,125 and 28,192. Of the present gang charged, about one-third appear to be sick. This is a very high proportion.

The other members of the gang see the terrible state to which neglect to give proper food and treatment in sickness has reduced many of their number. Each member knows that it may be his turn next and naturally they are in a state of great alarm. It is only some 2 or 3 months ago that this same Pinkande Superintendent either himself or by his Assistant charged 15 other coolies, with bolting. They were all acquitted, and the condition of some of them was so deplorable that I found it necessary to report the matter to a higher authority. Another point I would touch on is this—since war, coolies have been paid only ½ the cash they earn, the other half being set-off against the debts which are ordinarily irrecoverable. So that, in effect, this is equivalent to putting coolies on half pay. This involves much hardship to the cooly, who is necessarily drawn by shortage of cash to sell his rice to purchase curry stuffs, clothing and other necessaries. I do not think it necessary to discuss the legal aspects of this matter. I refer to it only to observe that under such circumstances, a Superintendent should be careful to see that his coolies are well looked after in other respects. I hold that the members of the gang have had reasonable cause to quit the complainant's employ and I acquit and discharge them.—*The Times of Ceylon.*

The number of packages and the averages realised for Indian tea, sold on garden account at the Mincing Lane auctions, during the week ended the 9th October, 1914, seasons 1912-13 and 1913-14, were as follows :—

	1914-15.		1913-14.	
	Number of packages.	Average.	Number of packages.	Average.
		d.		*d.*
Indian ...	39,251	9·22	66,316	9·41

—*Indian Planters' Gazette & Sporting News.*

COFFEE.

But for the fact that steps have been taken to stop Brazil kinds being sent to the ports of shipment unless actually sold, thus causing an accumulation in the interior which does not appear in the w'd's visible supply, the statistics for September would indicate that higher prices might be expected. The total stock was reduced during September by no less than 458,000 bags, against an increase last year of 697,000 bags, making a comparative deficiency of over a million bags in a month. It is also specially notable that the deliveries in Europe have been heavier than in any corresponding month for five years, and that the deliveries in the United States were with one exception the smallest; the latter is not of much count, as the deliveries there are often erratic, a small month being followed by a very heavy one. That Europe should have taken such large quantities is particularly notable, having regard to the difficulties in the way of delivery. Further auctions were held this week, but the actual quantity sold was rather less than in the previous week, and with the exception of some demand for Santos for the North of Europe, export business has been slow, and dealers are not encouraged to increase their stocks. At the same time, there is little inclination to allow orders to be forced down.

LONDON COFFEE RETURNS.

	Home* Consumption,		Export.		Stock.	
	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.	1914. Tons.	1913. Tons.
For week ended October 3rd ...	230	269	199	527	20,327	12,892
For 40 weeks ended October 3rd ...	11,851	11,710	19,419	16,283	—	—

* The Home amount contains a proportion for Export delivered by cart.

OFFICIAL STATISTICS OF THE COFFEE TRADE OF THE UNITED KINGDOM.

	1 month ended Sept. 20.			9 months ended Sept. 30.		
	1912.	1913.	1914.	1912.	1913.	1914.
Imports cwts...	40,303	40,376	20,644	567,551	646,245	811,562
Home Consumption cwts...	19.864	21,598	15,437	197,381	201,471	201,228
Exports cwts...	33,660	59,661	16,562	319,173	376,653	443,426
Total Deliveries cwts..	53,524	81,259	31,999	516,554	578,124	644,654
Stock on Sept. 30 cwts..	254,000	256,000	410,000	—	—	—

—*The Produce Markets' Review.*

The average realised at the Mincing Lane auctions of the following teas, including new season's, for the week ended the 9th October, 1914, as compared with the corresponding week's sale in 1913, is as follows:—

	Week ended 9th October.	Week ended 2nd October.	Corresponding week in 1913.
	d.	*d.*	*d.*
Indian ...	9·22	8·87	9·41
Ceylon ...	9·20	8·93	8·83
Java ...	8·61	8·66	8·30

—*Indian Planters' Gazette & Sporting News.*

BOTANIC GARDENS.
LIBRARY.
Class No. .....
Date .....